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This study compared female and male Air Force pilots across four differing methodologies. A computerized interview survey indicated several gender differences in attitudes toward military aviation. Males appear to continue to be uncomfortable with mixed squadrons. Females seem to have concerns about flying in combat. An in-depth personality test showed female pilots were in between male pilots and college student controls. A more global personality study showed that there are differences between early and mid-career female pilots with apparent changes across time. Finally, a new test of personality, psychopathology, and crew interaction was developed in order to more specifically quantify gender, selection, training, and retention issues.

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TABLE OF CONTENTS

Psychological Aspects of Female Aviator's Success

INTRODUCTION

The focus of the current work is the assessment of psychological variables in female and male student pilots. These variables include opinions and personality characteristics. An additional goal is the development of a new personality test which should better tap such variables in pilots.

Although female aviators have been an integral part of military aviation since World War II, little is known scientifically about the personality characteristics of these courageous women. Attempts to define the male personality, even "ace" qualities of combat aviators were carried out in the 1970's, and the Neuropsychiatry Branch participated in psychological testing of male astronaut candidates in the 1960's. Similar information for women aircrew is severely limited (1), but deserves immediate and sensitive study. Due to the historically very small number of females serving in an aviator capacity (perhaps as small as 2% of the total aviation community), a special effort is required to capture significant data on this uniquely challenged population.

Gen Merrill A. McPeak challenged USAF training and human factors experts to prepare women to fill combat mission roles. What qualities are desirable found in female candidates for these positions? Certain performance capabilities are thought to be critical to combat survivability and flight situational awareness (2). Do these skills need any additional training in women? How do female aviators view their career possibilities, and career goals versus family goals? Does Cockpit Resource Management pose special burdens or provide unique opportunities for women, as they have traditionally been viewed as possessing special interpersonal abilities (3).

Personality traits can be studied through psychological testing, while stress coping and emotional resilience can be inferred by epidemiologic review of mental health history. Demographic characteristics of these aviators can be cataloged. Lastly, a structured interview can provide information about career goals, and problems that have been encountered or anticipated. In the future USAF, every individual will be maximally stressed and will be depended upon for consistent performance. Without this baseline knowledge; training, health, and career longevity cannot be optimized for this growing aircrew population.

Jones (4) recognized a special need to study female aviators as early as 1983 when he published an alert to flight surgeons to be aware of the stress of conflicting roles that female aviators face. He clearly cautioned the aviation community that failure to recognize the needs of female aviators can lead to compromised flight safety. The need for

psychological data augments the necessary study of physiologic differences between male and female aviators.

McGlohn, King, and Retzlaff (5) completed a study of the personality and stressors of mid-career female US Air Force pilots under a grant from the Defense Women's Health Research Program over FY95. Personality testing and the interviews converged on a number of very interesting points. While the females and males had similar levels of Neuroticism and Openness to Experience, there were significant differences between the two groups on Extraversion, Agreeableness, and Conscientiousness. Women had higher levels of these traits. Extraversion includes warmth, gregariousness, assertiveness, activity, excitement-seeking, and positive emotions. Agreeableness includes variables such as trust, straightforwardness, altruism, compliance, modesty, and tender-mindedness. Conscientiousness includes variables such as competence, order, dutifulness, achievement striving, self-discipline, and deliberation. Both of these last two areas seem to be contrary to the "Right Stuff" of Retzlaff and Gibertini (6,7) lore. These areas though do seem to be traits which would make for a successful individual in an operational flight squadron.

Purpose:

The purpose of the current proposal was to extend the work of the last grant from this funding source. The last grant was successfully completed and pointed to three important personality components of successful female pilots. This grant applied similar methodology to a large group of incoming female aviators in order to determine if the personality characteristics are "born or bred". Female pilots entering initial flight screening/training were interviewed via computer for opinions and tested for the relevant personality characteristics. The first level of analysis was to compare their results to the known successful female pilots. A second purpose was to compare the two genders. A third goal was to develop a new and hopefully more sensitive and specific personality test for pilots. Finally, there is a need to develop an institutional archive of psychological data against which training and career outcomes may be compared in subsequent years.

Technical Objectives:

Opinion and psychological testing data will be collected, analyzed, and archived on a one-year sample of beginning level female aviators. A control group of males will also be collected. Additionally, a new personality test will be developed.

BODY

Statement of Work from the Proposal:

"The current proposal will be accomplished in the following

manner. First, final administrative actions for use of the Flight Screening program will be coordinated. At the same time, the new computers will be purchased and loaded with the appropriate software. The existing test will be purchased and the new test will be developed. The computers, software, and tests will be placed into the Flight Screening program. Data will be collected in large groups as part of the current intelligence medical screening of the Flight Screening program. After data collection, data analysis will occur. Finally, project reports, technical reports, and professional publications will be written."

Changes to the Statement of Work

The granting agency suggested the revision of this statement of work to include the elimination of the purchase of computers and the use of those monies to improve the new test development procedure. This was done. Data collection was arranged through the use of older computers and the archiving of the data was done through available Air Force Medical Operating Agency servers. All goals of the work were accomplished.

Method:

The US Air Force, through the Neuropsychiatry Branch of Armstrong Laboratory, currently accomplishes mandatory testing on all student pilots undergoing Enhanced Flight Screening. These 1000 to 1200 (per year) student pilots undergo the testing either during their time at Hondo, TX, or at the Air Force Academy. This testing data is archived for medical purposes at Armstrong Laboratory in computers controlled by the Enhanced Flight Screening program of the Air Force Medical Operating Agency.

The current study utilized this program and its procedures to collect the personality and opinion data needed. Permission for this was obtained. Participants received a full explanation of the study and signed informed consent forms.

For 10 months after funding of this proposal, all female student pilots were asked to participate in the study. A control group of male students were also asked to participate.

A computerized interview and two psychological tests were administered to the subjects. The computerized interview was adaptive and included 11 main items depending upon subject responses. Items such as "Why do you want to be a pilot?" and "Should any pilot have a choice as to whether or not to fly in combat?" were included.

One of the two tests can be scored in two ways which results in a total of three tests for data purposes. The first test was a test similar to the one administered to the mid-career females in the last study. That test was the NEO-PI-R (8). This test assesses Neuroticism, Extraversion, Openness to Experience,

Agreeableness, and Conscientiousness as well as 30 sub-scales. The test used in the FY95 study was the NEO-FFI (8). The NEO-FFI is a shorter version of the NEO-PI-R containing only the five main scales. NEO-FFI scales can be scored by using a subset of NEO-PI-R items. Therefore, the current study is using a more comprehensive version of this test but is able to compare some results directly to the FY95 mid-career data set.

The second test was developed specifically for this project. It ultimately included 15 scales of personality, psychopathology, and crew interaction. The intent of this test was to develop a psychological test which was more sensitive and specific to pilot samples. Most "off the shelf" psychological tests are constructed using psychiatric, college student, or general population samples. Pilots may endorse these tests in ways which limit reliability and validity.

The testing took about 2 hours of the subjects time and generally was non-aversive.

These measures and methodologies were chosen for a number of reasons. The first is one of practicality. The Enhanced Flight Screening program is a computer-based process. Therefore, only methods consistent with computer administration could be used. While face-to-face interviews could have been done, it would have resulted in a much lower number of subjects being tested. Of the three psychological personality tests, two on the face appear to be very redundant. That is due to the need to both assess the current sample very thoroughly and also allow for comparison with prior work. The two NEO tests are administered as a single large test. The other personality test was not "chosen" but the need for a new test was recognized and allows for a higher probability of successful research in the future.
Overview:

There are four major lines of data and analysis.

1) Interview Data. A computerized interview algorithm was developed and included in the EFS screening procedure. There are 11 items. A total of 648 subjects completed this procedure including 55 females and 593 males. Descriptive statistics were calculated. Chi Square tests of significance were conducted where possible.

2) NEO-PI-R Data. The 35 variable, comprehensive NEO-PI-R has been administered through EFS for the last year. This is a large, standardized personality test. A total of 309 subjects were included in this analysis with equal numbers (N=103) of female pilots subjects, male pilot subjects, and a control group of female college students. Data was analyzed through 1X3 ANOVA's and a discriminant function analysis.

3) NEO-FFI Data. The 5 variable, short NEO-FFI was used in the FY95 study of mid-career female pilots. This data was compared to the FY96 study of new female pilots. The more comprehensive

NEO-PI-R includes all the items for the shorter NEO-FFI. As such, the NEO-PI-R's being administered as part of the FY96 study can be re-scored to yield the 5 variables of the NEO-FFI. These then can be compared to the last study. Here 6 subject samples were used: female college students, male college students, female student pilots, male student pilots, female mid-career pilots, and male mid-career pilots. Statistically, 2X3 ANOVA's were done. With only 5 variables in this part of the protocol, multivariate work was of less importance.

4) Newly Developed Test. This work is in two parts and the first has been completed (see Appendix A). The Armstrong Laboratory Aviation Personality Survey (ALAPS) has been developed. This was developed on an initial subject sample of 200 student pilots tested between Feb 96 and May 96. There are 15 reliable and valid scales. Norms have been developed. Using a good part of the funding year for test development did not allow for immediate use of the test with female student pilots. This is particularly true given the low base rate of female subjects. This test will continue to be given for the next year (1997) after which sufficient numbers of female students will allow for contrast with male student pilots. This effort will be funded internally through the Surgeon General's Enhanced Flight Screening program.

Part 1: Interview Research Element

In an attempt to better understand the gender specific concerns of student pilots a computerized, adaptive interview survey was constructed. This survey asked questions about desires to fly, goals, concerns, and coping strategies of the student pilots.

A total of 648 student pilots volunteered to take the survey. Of this number, 55 were female and 593 were male.

Table 1-1 provides the questions and frequencies of answers. The statistical analysis of this data is somewhat difficult. Traditionally, a Chi Square test would be used to determine if one gender endorsed particular answers more often then the other gender. For example, Question 1 has 6 possible responses. A Chi Square could be used to look at differences here by calculating the statistic for the 2 (gender) by 6 (responses) matrix. The problem is, however, that the assumptions of the Chi Square test would be violated. Specifically, each of the 12 cells should have at least 10 observations. Many of these do not. With only 55 female subject and 6 possible responses, there are simply too many response categories with very few observations.

There is, however, a need to bring some statistical approach to the data in order to make any inferences as conservative as possible. On questions where there are only two possible responses such as Questions 4, 8, 9, and 10, 2 by 2 Chi Square tests are calculated. On the other items, Chi Squares are calculated at the response level as opposed to the question

level. Individual responses were analyzed for significance when a large and probably clinical level of difference was noted. All responses where there was at least a difference of 10% across genders were analyzed. For example, there is a 13% difference on response C of Question 1. Here, 42% of females had wanted to be pilots "since childhood" and 57% of males. A 2 by 2 Chi Square was calculated on these reponses by comparing those 42 and 57 percentages to the 58 and 43 percentages respectively who endorsed other responses. This Chi Square was equal to 4.59 and was not significant. In general, differences of 13% across genders resulted in significant differences. While this is less than a "pure" statistical solution, it allows for some level of statistical inference. Inferences from these tests are viewed with caution.

A number of differences are seen across the two groups as well as non-significant differences. No differences were found across genders for "Why do you want to be a pilot?". As for long term flying goals, males were more interested in flying fighter aircraft (Chi Square = 9.26, $p < .05$) and female more interested in flying for the airlines (Chi Square = 13.60, $p < .05$). Long term non-flying goals were not different across genders. Females felt mixed gender squadrons would result in better working conditions than males (Chi Square = 9.13, $p < .05$). Specifically, for those feeling it would be worse, males believed they would "Have to be more aware of gender issues" (Chi Square = 5.44, $p < .05$). Specifically for those who felt it would be better, females felt that it would be better due to having "access to the broadened perspective of both genders" (Chi Square = 6.80, $p < .05$). No differences were found for "Are you prepared to be a POW?" Females were more concerned with sexual assault as a POW (Chi Square = 24.49, $p < .05$) while males were more worried about families back home (Chi Square = 9.92, $p < .05$). No differences were found for "Why would you want to fly in combat?" Females were more comfortable flying combat in a mixed squadron than males (Chi Square = 13.80, $p < .05$). Males felt they would be more protective of one sex than the other flying in combat (Chi Square = 45.76, $p < .05$). Females more often expressed the belief that a pilot should have the right to elect not flying in combat (Chi Square = 9.21, $p < .05$). Finally, there were no significant differences for how the student pilots cope with stress.

Table 1-1

Interview Responses

	FEMALE N=55 N	%	MALE N=593 N	%
1. Why do you want to be a pilot?				
A. A family member was a pilot or aircrew member.	1	2	11	2
B. It would be exciting or fun.	19	35	176	30
C. I have always wanted to be a pilot since childhood.	23	42	337	57
D. I am a private pilot.	3	5	14	2
E. It would be stable and lucrative profession.	3	5	18	3
F. I went to the Air Force Academy and was pilot qualified.	1	2	9	2
G. Other.	5	9	28	5
2. What are your long-term flying career goals?				
A. Fly as long as I can on active duty before I have to take a staff job.	7	13	118	20
B. Become an aircraft commander.	2	4	43	7
C. Become an instructor pilot.	2	4	14	2
D. Fly a fighter aircraft.	5	9	166	28*
E. Fly for the airlines.	15	27	62	10*
F. Become a test pilot.	2	4	36	6
G. Become an astronaut.	9	16	107	18
H. Fly for the reserves.	8	15	16	3
I. Other.	5	9	31	5
3. What are your long-term non-flying goals?				
A. Get a lucrative civilian job.	7	13	54	9
B. Start a family.	25	45	252	42
C. Become a flight commander.	0	0	9	2
D. Become a squadron commander.	3	5	76	13
E. Become an operations officer.	0	0	6	1
F. Become a General officer.	6	11	136	23
G. Other.	14	25	60	10
4. Do you imagine that working relationships are better or worse in mixed-gender squadrons?				
A. Worse	7	13	192	32*
B. Better	48	87	401	68

4a. If Worse:
How would you imagine that working relationships are worse in mixed-gender squadrons?

A. Increased sexual tension.	1	2	35	6
B. Greater conflict.	0	0	37	6
C. Can't be myself with my friends at work.	0	0	8	1
D. "More competition for good jobs, thus resentment."	3	5	7	1
E. Have to be more aware of gender issues.	3	5	105	18*

4b. If Better:
How would you imagine that working relationships are better in mixed-gender squadrons?

A. Less mystery about what it will be like to work closely with the opposite sex.	1	2	6	1
B. Increased opportunities for everyone.	3	5	25	4
C. Increased awareness of gender issues.	2	4	19	3
D. Have access to the broadened perspective of both genders.	28	51	198	33*
E. More diversity in the workplace.	14	25	153	26

5. Are you prepared to be a POW?

A. Yes.	31	56	366	62
B. No.	6	11	49	8
C. Don't know.	18	33	178	30

6. What is your greatest concern about being a POW?

A. Sexual assault.	8	15	13	2*
B. Physical harm.	10	18	62	10
C. Psychological harm.	3	5	19	3
D. Letting down my squadron mates if I break.	2	4	19	3
E. Letting down my country if I break.	7	13	112	19
F. Presence of female POW's.	0	0	15	3
G. Concerns about my family at home.	5	9	171	29*
H. Conditions of the camp.	0	0	5	1
I. Length of time in captivity.	5	9	52	9
J. Being exploited or used to hurt others.	14	25	112	19
K. Other.	1	2	13	2

7. Why would you want to fly in combat?

A. It will be my job and responsibility.	33	60	335	56
B. It is what I will be trained to do.	10	18	108	18
C. It would be exciting.	2	4	48	8
D. I could prove myself in the ultimate test.	6	11	88	15
E. I could improve my chances of advancing my career.	0	0	2	0
F. I don't want to fly in combat.	4	7	12	2

8. Would you feel comfortable flying in combat with both genders?

A. Yes.	55	100	472	80*
B. No.	0	0	121	20

9. Would you be more protective of one or the other gender in combat?

A. Yes.	3	5	315	53*
B. No.	52	95	278	47

10. Should any pilot have a choice as to whether or not to fly in combat?

A. Yes.	28	51	183	31*
B. No.	27	49	410	69

11. How do you cope with stress?

A. Good communication with significant others.	13	24	82	14
B. Exercise or sports.	20	36	224	38
D. Alcohol.	3	5	55	9
E. I take care of the problem on my own.	4	7	44	7
F. I talk about stress with friends.	6	11	65	11
G. Through my religion.	1	2	11	2
H. Throwing myself into my work.	6	11	98	17
I. Relaxing hobbies or activities.	2	4	14	2

* denotes significant Chi Square test

Part 2: NEO-PI-R Research Element

Only about 2% of current mid-career USAF pilots are women. This percentage will increase due to larger percentages in the training pipeline. As such, psychological differences between male and female Air Force pilots are of interest.

The lay impression of the "Right Stuff" has given way to a more thorough understanding of male pilots. Most psychological test data, however, has not included data on female military pilots.

The purpose of the current work element is to compare the personality profiles using the NEO-PI-R of male and female student pilots.

Three groups of subjects were contrasted. Each group had 103 subjects. The groups included entry level female student pilots, similar male student pilots, and a control group of female college students. All Air Force subjects were tested during Enhanced Flight Screening and the college sample was collected on the campus of a western state university.

Table 2-1 presents the univariate differences among the three groups. The college females are highest on Neuroticism and the male pilots lowest. These differences were mirrored on the Anxiety, Depression, and Vulnerability sub-scales. No differences were found under any of the Extraversion scales. Male pilots scored lowest on the Openness to Experience factor. Female college students scored particularly high on the Feelings and Values sub-scales. Little was seen in the Agreeableness scales with the exception of Tender-mindedness where college females scored particularly high and male student pilots low. Finally, on the Conscientiousness scales, college females scored the lowest and male student pilots the highest. The subscales include specifically low scores for the college females on Dutifulness, Achievement, and Discipline. In general, the female Air Force student pilots scored between the male student pilots and the female college students on most NEO-PI-R scales where significant differences were found.

Tables 2-2 through 2-4 provide a discriminant function analysis of the data. Again, from a multivariate perspective, a number of unique variables enter the equations. The female pilots are again usually found to be somewhere between the male pilots and the female student.

TABLE 2-1

NEO-PI-R Means and Standard Deviation for Each Group.

Scale	Air Force Females(1)		College Females(2)		Air Force Males(3)		F(2,306)
N	82.52	23.33	97.12	22.64	68.55	17.83	45.85*a
ANXIETY	16.00	5.05	18.75	4.91	12.99	4.40	37.18*a
ANGRY	12.98	5.03	15.49	5.46	12.00	4.93	12.61*c
DEPRESS	13.00	5.75	15.94	6.07	9.99	4.09	31.53*a
SELFCONC	14.42	4.95	16.25	5.48	12.80	4.15	12.79*d
IMPULSIV	16.94	5.17	18.66	4.44	14.32	4.36	22.52*b
VULNER	9.16	3.69	12.01	4.60	6.44	3.01	54.66*a
E	128.35	19.79	126.63	20.63	127.77	17.36	0.21
WARMTH	23.70	4.64	24.21	4.74	22.86	4.11	2.35
GREGAR	18.95	5.82	19.69	5.91	18.35	4.71	1.53
ASSERT	19.18	4.65	17.89	5.60	20.48	4.25	7.28
ACTIVI	21.12	3.40	19.77	4.22	21.68	3.86	6.73
EXCITE	22.29	3.92	21.70	4.91	22.73	3.42	1.60
POSITI	23.09	4.57	23.33	5.11	21.64	4.40	3.92
O	124.32	17.81	128.01	20.13	111.93	19.83	19.65*b
FANTASY	19.85	5.29	21.13	5.44	18.48	4.75	6.76
AESTHET	20.08	5.26	21.75	6.23	16.10	5.84	25.85*b
FEELINGS	22.97	4.19	24.83	3.78	20.42	4.82	27.42*a
ACTIONS	18.73	3.98	16.95	4.03	16.96	4.05	6.74
IDEAS	21.19	4.46	19.97	5.68	21.20	5.61	1.85
VALUES	21.47	3.54	23.36	4.32	18.74	4.44	32.71*a
A	118.39	18.36	121.35	17.04	112.26	17.02	7.25
TRUST	20.59	5.34	19.65	4.93	19.91	4.82	0.96
STRAIT	19.97	4.80	20.61	4.82	19.23	4.04	2.34
ALTRU	24.00	3.80	24.58	3.72	23.00	3.50	4.81
COMPLIAN	16.25	4.32	16.48	5.20	15.98	4.15	0.31
MODESTY	18.28	4.52	18.76	4.72	16.55	4.44	6.69
TENDER	19.30	3.44	21.26	3.23	17.57	3.93	27.86*a
C	124.70	20.17	114.91	21.82	132.65	15.60	21.65*e
COMPET	22.68	3.79	21.60	3.69	24.80	2.88	22.55*g
ORDER	18.82	4.95	17.93	5.33	19.59	4.27	2.99
DUTIFUL	22.72	4.44	20.72	3.96	24.28	3.40	20.81*f
ACHIEVE	22.12	4.05	19.51	4.81	23.39	3.56	23.14*f
DISCIPL	21.38	4.69	19.09	5.70	23.00	3.50	17.87*f
DELIBERA	16.95	4.08	16.03	5.00	17.56	3.97	3.16
N	103		103		103		

NOTE: * DENOTES SIGNIFICANCE AT .0001. TUKEY'S MULTIPLE COMPARISONS at .01 with not significantly different means underlined: a=2 1 3, b=2 1 3, c=2 1 3, d=2 1 3, e=3 1 2, f=3 1 2, g=3 1 2

TABLE 2-2

Discriminant Function Summary Table

Step	Variable Entered	F Value to Enter	U	F	DF
1	VULNER	54.662	0.7368	54.662	2,306
2	VALUES	19.503	0.6532	36.184	4,610
3	POSITI	12.729	0.6028	29.188	6,608
4	ACTIONS	7.669	0.5737	24.258	8,606
5	TENDER	6.239	0.5510	20.973	10,604
6	DUTIFUL	4.030	0.5366	18.319	12,602

TABLE 2-3

Discriminant Function Classification Functions

Variable	Air Force Females	College Females	Air Force Males
VULNER	1.67873	1.82818	1.46736
POSITI	1.08537	1.15520	0.98015
ACTIONS	0.73177	0.55207	0.67162
VALUES	0.93443	1.05241	0.82367
TENDER	0.55128	0.69827	0.49834
DUTIFUL	1.89494	1.79912	1.93419
CONSTANT	-65.06996	-68.61212	-57.71193

Table 2-4

Classification Matrix

Group	Percent Correct	Number of Cases Classified into Group: Air Force Females	College Females	Air Force Males
Air Force Females	38.8	40	28	35
College Females	76.7	15	79	9
Air Force Males	72.8	18	10	75
Total	62.8	73	117	119

Part 3: NEO-FFI Research Element

This research element is similar to research element number 2 except that fewer variables are used but that three additional subject samples are used. Element 2 provides extensive data on female and male student pilots as well as a control sample of female college students. Here female student pilots, female mid-career pilots, and female college students are contrasted with 3 like male samples.

A total of 455 subjects are used. The student pilots are from the current data collection. The mid-career pilots are from the FY95 women's study. Finally, the college students were from a large Rocky Mountain, state university.

Again, data from the FY96 NEO-PI-R testing was rescored to make comparison with the FY95 test data. While the NEO-PI-R allows for the calculation of 35 scores, this NEO-FFI approach allows for only the five main scales to be scored.

Table 3-1 provides the 2X3 ANOVA's for the work. All main effects were significant. Table 3-2 provides the cell means and the multiple comparison tests.

A number of gender and career level differences are found examining Table 3-2. Looking at gender differences first, female student pilots are significantly higher on Neuroticism than male student pilots. Differences are not found for mid-career pilots. No significant differences are found for the Extraversion variable. On the Openness variable, again, female student pilots are higher that male student pilots with no differences for mid-career pilots. On Agreeableness, no student pilot differences are found but mid-career female pilots are higher than mid-career male pilots. Finally, no significant differences are found for either group on the Conscientiousness variable.

Looking at the difference across career levels a number of things are seen. First, there are no significant differences between the male student pilots and the mid-career pilots on any of the variables. This indicates that there is little change in pilots personality across time and/or that there is little selection of certain personality characteristics in retention.

Female pilots do show differences. Specifically, the student female pilots are higher on Neuroticism than the mid-career female pilots. Secondly, female mid-career pilots are higher on Agreeableness than the female student pilots. This suggests one of three things. First, it may be that female pilots change personalities to some degree across a career becoming less affective and more agreeable. Second, it could be that agreeable female pilots are retained and the affective female pilots leave the service. Third, it could be that some societal cohort effect is at work. Here it would be hypothesized that females coming into pilot training 10 years ago were less

affective and more agreeable than those seeking to serve these days.

Some of these results may appear at odds with the FY95 data analysis. In that analysis, female mid-career pilots were found to be higher on Extraversion, Agreeableness, and Conscientiousness than mid-career male pilots. Those results were based upon t-test statistical analysis. The current work only found statistically significant differences between the two mid-career samples on the Agreeableness variable. This data was first analyzed with ANOVA and then multiple comparison tests were calculated with the Tukey statistic. The Tukey procedure is far more conservative than t. This is particularly true when there are a large number of groups and paired comparisons. Therefore, the current analysis has "lost" some of the prior significances due to statistical procedural changes mandated by the larger number of groups.

Table 3-1

ANOVA Summary Tables for NEO-FFI Scales.

Neuroticism

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F VALUE	PROBABILITY
GROUP	6434.0899	2	3217.0449	63.81	0.0000
GENDER	1190.3485	1	1190.3485	23.61	0.0000
INTERACTION	747.0566	2	373.5283	7.41	0.0007
ERROR	22635.2678	449	50.4126		

Extraversion

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F VALUE	PROBABILITY
GROUP	440.6378	2	220.3189	6.06	0.0025
GENDER	305.9738	1	305.9738	8.41	0.0039
INTERACTION	179.7682	2	89.8841	2.47	0.0857
ERROR	16332.8746	449	36.3761		

Openness

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F VALUE	PROBABILITY
GROUP	228.4601	2	114.2301	3.06	0.0478
GENDER	378.5907	1	378.5907	10.15	0.0015
INTERACTION	198.4494	2	99.2247	2.66	0.0710
ERROR	16748.4920	449	37.3018		

Agreeableness

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F VALUE	PROBABILITY
GROUP	1095.6904	2	547.8452	16.68	0.0000
GENDER	691.6500	1	691.6500	21.06	0.0000
INTERACTION	225.9184	2	112.9592	3.44	0.0329
ERROR	14746.7954	449	32.8436		

Conscientiousness

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F VALUE	PROBABILITY
GROUP	4203.8841	2	2101.9421	56.44	0.0000
GENDER	324.3475	1	324.3475	8.71	0.0033
INTERACTION	818.3574	2	409.1787	10.99	0.0000
ERROR	16722.3367	449	37.2435		

Table 3-2

Means and Standard Deviations of Groups.

Scale	1 College	2 Students	3 Career	Tukey
Neuroticism				
Female	24.4 (7.5)	20.0 (8.0)	14.3 (6.1)	1 2 3
Male	22.1 (8.0)	13.1 (6.0)	13.4 (6.4)	1 3 2
sign.	ns	*	ns	
Extraversion				
Female	32.6 (6.5)	33.1 (6.5)	35.0 (5.9)	3 2 1
Male	30.0 (5.7)	33.1 (4.8)	32.5 (6.5)	2 3 1
sign.	ns	ns	ns	----
Openness				
Female	31.4 (6.6)	30.8 (5.9)	27.9 (5.8)	1 2 3

Male	28.4 (6.2)	27.9 (5.6)	28.1 (6.4)	1 3 2
sign.	ns	*	ns	
Agreeableness				
Female	31.1 (6.0)	31.8 (6.3)	35.1 (4.9)	3 2 1
Male	27.5 (5.5)	31.1 (5.4)	31.7 (5.5)	3 2 1
sign.	*	ns	*	
Conscientiousness				
Female	31.7 (7.4)	34.7 (6.4)	37.9 (5.9)	3 2 1
Male	27.2 (5.6)	36.4 (4.9)	35.4 (5.6)	2 3 1
sign.	*	ns	ns	
N				
Female	103	91	48	
Male	58	91	64	

Note: Tukey multiple comparisons using .01 were done at the cell level across group and across gender. For group, not significantly different means designated by group number are underlined. For gender, * denotes significant differences.

Part 4: ALAPS Test Construction Research Element

Part of the current work effort was directed toward the development of psychological tests optimized to the pilot samples. It is hoped that such optimized tests will better describe differences between female and male pilots.

Toward that end, a good deal of FY96 grant effort went toward the development of the Armstrong Laboratory Aviation Personality Survey (ALAPS). The test measures three general areas of psychological interest. These include personality, psychopathology, and crew interaction styles. Some of the 15 scales of the test are similar to existing tests such as the Anxiety and Depression scales. Some of the scales are fairly unique to multiscale tests such as the Dogmatism and Team Oriented scales.

While most of these variables could have been collected through existing tests, the optimization of the set of scales into a single package for pilots is quite unique. Many existing tests of psychopathology were developed on psychiatric samples. As such, the items are often seen as offensive, inappropriate, or irritating for pilots. Many existing tests of personality were developed on general population samples. Here items may be too general for pilots. Finally, there are several tests of crew interaction available but often these tests assess only one variable at a time. To capture the 6 variables in the ALAPS could easily take 6 individual tests of differing orientation, length, and quality.

A final need for the new test beyond optimization and efficiency is a statistical issue. While on the surface these scales may appear to be similar to existing tests, the underlying psychometric quality of a test is driven by its development. To have a test that is highly reliable and potentially highly valid for pilots, the test must be developed using pilot samples.

Data collection continues with this device and sufficiently large samples of female pilots are expected within a year to use the test for its intended purpose.

Appendices A-C provide a detailed description of its development and may be used as "stand alone" documentation. Below is a summary and the more important tables. Table 4-1 provides the normative data. Table 4-2 provides a percentile level conversion table. Table 4-3 indicates the very high reliabilities of the test.

The rather complex validity analysis is in Appendix A. The validity of the test has been initially determined through side-by-side comparison to a known test of relatively high psychometric quality. In this case the ALAPS was compared to the NEO-PI-R. In general, scales of similar construct correlated highly. For example, ALAPS Anxiety correlates with NEO-PI-R Anxiety at .61. Depression with Depression at .55. Social with

Gregarious at .66. Order with Order at .69. Impulsivity with Deliberation at -.74.

ALAPS Description:

Format The ALAPS is a 240 item test. The subject is requested to respond in a "true" or "false" manner as each item applies to the subject. The test usually takes between 20 and 30 minutes to complete. The test may be used in paper-and-pencil format or by computer administration.

There are 16 items keyed to each scale. All items are "unique" to a scale and as such no items are keyed to more than one scale.

Scales There are 15 scales divided into personality, psychopathology, and crew interaction categories. The Personality scales include Confidence, Socialness, Aggressiveness, Orderliness, and Negativity. The Psychopathology scales include Affective Lability, Anxiety, Depression, and Alcohol Abuse. Finally, the Crew Interaction scales include Dogmatism, Deference, Team Oriented, Organization, Impulsivity, and Risk Taking.

Personality Scales:

CONFIDENCE: High scorers view themselves as highly capable, intelligent, and talented. This can include the negative elements of arrogance, manipulation, and condescension. Clinically these traits may suggest narcissism.

SOCIALNESS: High scorers are extremely social and outgoing. They enjoy others and are socially comfortable. They see themselves as friendly and charming. Clinically this may include elements of histrionic personality.

AGGRESSIVENESS: High scorers are assertive to the point of being aggressive. They take strong stands and tolerate little criticism. They are verbally and emotionally combative. This quality probably does not rise to the level of antisocial personality.

ORDERLINESS: High scorers are orderly in a behavioral and environmental way. Their lives are structured and neat. They are methodical and disciplined. This may clinically rise to the level of compulsive personality disorder.

NEGATIVITY: High scorers are angry, negative, and cynical. They are socially punitive and not pleasant to be around. Clinically this may rise to the level of negativistic or passive-aggressive personality.

Psychopathology Scales:

AFFECTIVE LABILITY: High scorers are generally emotional and reactive. They can be situationally anxious, depressed, and frightened. Moods are seen as changing quickly with little provocation. Affect is volatile.

ANXIETY: High scorers are chronically anxious. They worry and brood. The anxiety interferes with their lives and occupational functioning.

DEPRESSION: High scorers are depressed. Problems include dysphoric affect as well as the cognitive and vegetative symptoms of depression. They report being pessimistic, unhappy, and guilty. Extreme elevations may include clinical major depression.

ALCOHOL ABUSE: High scorers like to drink, drink a great deal, and get intoxicated. Functioning is impaired and there may be social and occupational problems.

Crew Interaction scales:

DOGMATISM: High scorers believe what they believe is always correct and are not open to change. They are authoritarian interpersonally. They are intolerant of other people, ideas, and actions.

DEFERENCE: High scorers are deferent to a fault. They are submissive and quiet. They concentrate on their job and are uncomfortable questioning the status quo.

TEAM ORIENTED: High scorers enjoy and believe in team work. They value the team effort and team rewards. They do not enjoy working alone and may be inefficient when working alone.

ORGANIZATION: High scorers are systematic and organized. They coordinate and plan all elements of a project. They think things through thoroughly.

IMPULSIVITY: High scorers act first and think second. They often act and talk without sufficient forethought. They see themselves as spontaneous. Others may be less generous in their assessment.

RISK TAKING: High scorers enjoy danger and risk. New activities and situations are not frightening. They are adventurous, unafraid, and fun-loving. They are not necessarily impulsive about their activities; their actions may be calculated and include a rational appreciation of the inherent danger.

Table 4-1

ALAPS Norms

Scale	MEAN	SD	Range
PERSONALITY (BEHAVIORAL STYLES)			
CONFIDENCE	9.7900	2.9238	2-16
SOCIALNESS	12.9050	3.3319	1-16
AGGRESSIVENESS	9.3450	2.8875	1-16
ORDERLINESS	12.4500	3.2512	0-16
NEGATIVITY	5.2700	3.0633	0-15
PSYCHOPATHOLOGY (COPING STYLES)			
AFFECTIVE LABILITY	5.0900	3.8452	0-16
ANXIETY	2.2400	3.0445	0-16
DEPRESSION	1.3300	1.9208	0-14
ALCOHOL ABUSE	7.2100	4.3231	0-16
CREW INTERACTION (INTERPERSONAL STYLES)			
DOGMATISM	5.9300	2.9782	0-14
DEFERENCE	6.3750	3.0841	0-15
TEAM ORIENTED	12.4000	3.4613	2-16
ORGANIZATION	12.8400	3.1582	0-16
IMPULSIVITY	7.0750	3.6956	0-16
RISK TAKING	12.0350	3.1565	2-16

note: N=200.

Table 4-2

ALAPS Percentile Conversion Table

	Raw Score															
Scale	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
CONFID	<	<	1	2	5	9	12	21	33	44	57	70	84	90	95	99	>
SOCIAL	<	1	2	3	5	6	7	10	12	14	18	22	30	43	60	82	>
AGGRES	<	1	2	3	5	9	16	24	37	53	68	77	86	92	97	99	>
ORDERC	<	<	1	3	5	6	7	8	10	17	22	29	39	51	68	91	>
NEGATI	4	9	20	30	43	57	72	79	86	90	94	96	98	99	>	>	>
AFFECT	5	19	33	43	53	64	70	74	77	85	90	93	95	97	98	99	>
ANXIET	42	58	69	77	81	85	88	92	93	97	98	99	>	>	>	>	>
DEPRES	44	69	83	90	94	96	98	99	>	>	>	>	>	>	>	>	>
ALCOHO	9	15	19	24	28	35	44	50	58	67	73	80	88	95	98	99	>
DOGMAT	2	7	13	20	32	47	63	71	82	91	93	95	97	99	>	>	>
DEFERE	1	4	8	18	30	44	56	68	77	85	91	93	95	97	99	>	>
TEAMOR	<	<	1	2	4	6	10	11	16	20	23	33	39	52	66	80	>
ORGANI	<	<	1	3	4	5	6	7	10	14	20	25	33	45	62	84	>
IMPULS	2	6	9	19	29	37	49	57	63	72	80	88	93	95	98	99	>
RISKTA	<	<	1	2	5	6	8	10	14	19	23	35	46	62	78	91	>

Table 4-3

ALAPS Scale Internal Consistencies (Reliabilities).

Scale	Alpha
CONFID	.71
SOCIAL	.85
AGGRES	.73
ORDERC	.83
NEGATI	.74
AFFECT	.85
ANXIET	.86
DEPRES	.76
ALCOHO	.89
DOGMAT	.73
DEFERE	.75
TEAMOR	.84
ORGANI	.83
IMPULS	.82
RISKTA	.80

Note: Alpha is a Cronbach Alpha internal consistency (reliability) statistic.

CONCLUSIONS

The current work points to a number of interesting differences between early career female and male pilots. This effort was actually four studies looking at the issues of gender differences from a number of perspectives.

Interview survey data pointed to a number of differences in the perception of stressors, concerns, and career desires between female and male pilots. Of particular interest in that set of data is the concerns men express in integrated squadron and combat units. The male subjects consider this to be a very important issue and more importantly it does not seem to be resolved. The other interesting policy issue is that the female pilots appear to be very concerned about actual combat. They believe that combat assignments should be elective. This needs to be addressed.

In-depth personality assessment comparing female student pilots, male student pilots, and a control group of female college students showed many interesting differences. In general, female and male student pilots are different. The female pilots are also different from the control group. The female pilots are generally half way between the other two groups. It is likely that this data also shows that a certain personality type among female college students is drawn to service as an Air Force pilot. This could be used with additional work to aid in the selection of female aviators.

Personality data was also collected to contrast female and male college students, student pilots, and mid-career pilots. This data indicated that a particular type of female student pilot ends up in an Air Force pilot career. Across time and/or retention, female pilots tend to become less emotional and more agreeable. This could be caused by actual personality change across time or it could be a retention bias. These changes are particularly relevant given the fact that male pilots appear not to change across their careers.

Finally, a new test of personality, psychopathology, and crew interaction was developed. It is hoped that this test will better show changes across time and gender in Air Force pilots. This test was constructed on this population and continues to be administered. All data is being archived for future work. The first of these projects will be the comparison of female and male student pilots when sufficient data has been collected. It should prove of great use in a number of military selection, training, and retention issues.

Data Archive

A major goal of this work was to archive the data for future research. This has been accomplished. The individual level data for this work is archived with the rest of the Enhanced Flight

Screening data on an Air Force Medical Operating Agency server. This server also archives other medical data such as the cardiac and opthalmology workups. As such, the psychological data should not become "orphaned" or "lost". Currently, this server is located at Armstrong Laboratory, Brooks AFB, TX. The Neuropsychiatry Branch is the current host function for the psychological portion of this work. Their office symbol is AL/AOCN. In out years, the data should be retrievable through the Air Force Medical Operating Agency or the Surgeon General's office.

Future Work

It is our intent to collect outcome data on this sample. Through the Enhanced Flight Screening program, support is available to follow this sample (as well as other samples) through training, career, and retention time points.

Within the year we should be able to compare these data to initial flight outcomes through the flight training element of the Enhanced Flight Screening program. We have access to those data and have begun to collect it. Within two years, we should be able to compare these data to Undergraduate Pilot Training outcomes. Armstrong Laboratory has access to AFSC and termination data which should allow for UPT outcome data collection. Finally, out ten years or so, we should be able to use these data to model career retention.

Administrative Issues

The Statement of Work has been accomplished as amended by the granting agency. All data collection proposed has been accomplished. The new psychological test has been developed and continues to be used through the Enhance Flight Screening program. The data has been archived as noted above. Finally, as no capital expenditures for equipment or computers were made, no equipment disposition issues are relevant.

The current work has shown a number of interesting differences between female and male pilots. It is critical that such work continue.

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Appendix A

The Development of the Armstrong Laboratory Aviation Personality Survey (ALAPS).

The accurate assessment of aviation personnel requires specialized and optimized devices. This is particularly true in the area of psychological assessment (Damos, 1996; Johnston, 1996; Goeters, Timmermann, and Maschke, 1993).

The psychological assessment of pilots through testing has a long history with many valuable contributions (Hormann & Maschke, 1996; Dolgin & Gibb, 1988; Picano, 1991; Retzlaff & Gibertini, 1987; Retzlaff and Gibertini, 1988; Siem, 1992). Traditional psychological tests, however, are of less than optimal value when applied to the assessment of aviator's personality, psychopathology, and interpersonal interaction. Tests developed for use with psychiatric patients (e.g. Millon, 1983; Millon, 1987) often offend high functioning individuals (King, 1994; Flynn, Sipes, Grosenbach, & Ellsworth, 1994). The dimensions and scales often have little to do with the referral questions. Further, the psychometrics of the instruments are often unknown when used with populations different from the intended (Gibertini, Brandenburg, & Retzlaff, 1986; Rourke, Costa, Cicchetti, Adams, & Plasterk, 1991; Franzen, 1989).

There are few specialized tests used for pilot and astronaut selection. They, however, are not published and hence tend to be obscure. Often they have no standardized administration form, manual, or psychometric data. Tests must have established norms, reliabilities, and validities in order to be properly evaluated.

The purpose of the Armstrong Laboratory Aviation Personality Survey (ALAPS) is to provide an inventory with appropriate scales, established norms, high reliability, and solid validities for the aviation industry.

ALAPS Description

Format The ALAPS is a 240 item test. The subject is requested to respond in a "true" or "false" manner as each item applies to the subject. The test usually takes between 20 and 30 minutes to complete. The test may be used in paper-and-pencil format or by computer administration.

There are 16 items keyed to each scale. All items are "unique" to a scale and as such no items are keyed to more than one scale.

Scales There are 15 scales divided into personality, psychopathology, and crew interaction categories. The Personality scales include Confidence, Socialness, Aggressiveness, Orderliness, and Negativity. The Psychopathology scales include Affective Lability, Anxiety, Depression, and Alcohol Abuse. Finally, the Crew Interaction scales include

Dogmatism, Deference, Team Oriented, Organization, Impulsivity, and Risk Taking.

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RISK TAKING: High scorers enjoy danger and risk. New activities and situations are not frightening. They are adventurous, unafraid, and fun-loving. They are not necessarily impulsive about their activities; their actions may be calculated and include a rational appreciation of the inherent danger.

Construction Plan

The ALAPS was developed using the domain theory test construction model (Nunnally, 1978). This model uses most other construction approaches in a systematic and integrative manner. It includes, in appropriate order, clinical content development, internal statistical homogeneity item selection, and, finally, validity estimate establishment.

Content is the first element of domain theory test construction. Here the domains (scales) of interest are generated by examining the literature, interviewing experts, and analyzing referral questions. After the domains are fixed, items are written that are "face valid" and saturate the domain of interest. More items than expected in the final form are generated in order to eliminate internally inconsistent items. Items are reviewed by expert judges to ensure widespread support of the content. Finally, subjects review the items for objectionable content. All items are written simply and in a straightforward manner. Double negatives and awkward grammar are avoided.

Internal consistency is developed through the elimination of items that do not correlate with the item pool as a whole. In order to accomplish this goal, an initial form of the test is

given to a large and representative sample of subjects. Within each scale, each item is correlated with the total score for that scale. Items with low item-total correlations are eliminated. In essence, the item pool is statistically "cleansed". This active process of making the item pool homogeneous results in high final scale reliabilities (internal consistencies).

Empirical validation is the final step. Here the final internally consistent and content-rich scales are given to a sample along with some other test of similar content. High, appropriate, and logical correlations suggest construct validity of the new scales (Campbell & Fiske, 1959; Suen, 1990).

Scale and Item Development

Domain development was accomplished as planned. Eight psychologists and psychiatrists familiar with aviation evaluation issues reviewed the literature, currently used tests, other available tests, diagnostic manuals (American Psychiatric Association, 1994), and referral questions in order to develop an initial relatively exhaustive (and unwieldy) list of domains of interest. From that point, dimensions were eliminated, collapsed, and added with an eye toward a target of about 20 scales. This number was agreed upon given the probable number of items per scale and the desirability of a short, easy to administer test. Finally, a list of 18 scales was set. It included all of those described above plus Somatization, Communication Openness, and Achievement.

Item writing proceeded in an iterative fashion with items being written and edited until a consensus was reached that items were readable, applicable, and straightforward. It was determined that 24 initial items per scale would allow for a final 16 per scale that were internally consistent.

Item elimination started with the administration of the test to an initial sample of 86 male and female college undergraduates. This was done to "pre-test" the items. It was found that about 10% of the items had no variance or had poor item-total correlation. This allowed for the elimination of the very poorest items prior to the use of actual Air Force subjects. Eliminated items were replaced with new (and "improved") items.

Following this pre-testing, the initial form of the test with 432 items (18 scales with 24 items per scale) was administered to 200 US Air Force student pilots as part of a larger medical screening procedure (King & Flynn, 1995). The subjects included Air Force Academy, Reserve Officer Training Corps, Officer Training School, and National Guard officers and candidates. Only about 8% were female. The vast majority of subjects were in their 20's.

Item variance was the first level of analysis. In general, items were eliminated when fewer than 5% or more than 95% of the subjects answered "true".

Item-total correlations were examined next. Each subject's answers were converted to a "1" if endorsed in the keyed direction and a "0" if endorsed in the non-keyed direction. These items were then correlated with the total score for the 24 items of each scale. Items with negative, non-significant, or low correlations were eliminated.

Items were also correlated with the total scores for all other scales. In general, items that correlated with other scales higher than their own scale were eliminated.

Item-factor loadings were also done. Here a single factor was extracted and item-loadings were examined. While these loadings paralleled the item-total correlations in most cases, some differences were found due to the limited variance of some of the psychopathology scales. Optimum item-total and item-factor items were retained.

Some scales did not survive the item selection and reliability stages of construction. Somatoform, Communication Openness, and Achievement scales were eliminated when item statistics and initial reliabilities failed to reach acceptable levels. Only scales with internal consistencies above .70 were retained.

The outcome of these procedures (see Appendix B) included 15 scales each with 16 items. About 20% of the items are "False" keyed with "False" responses adding 1 point to the score. These 240 items were placed in a final form (see Appendix C) that rotated presentation of the items across scales. The first 15 items are the first item from each of the 15 scales in order of scale name. The second 15 items in the final format were the second items in each scale. And so on. The final form appears easy to administer and lends itself to easy hand scoring.

Norming

Table 1 provides the means, standard deviations, and ranges for each of the 15 ALAPS scales. These data are from the 200 student pilots in the construction sample. As can be seen, most means are relatively in the middle of the ranges. The notable exceptions are the clinical scales such as Anxiety and Depression. While these traits are relatively uncommon in the population, there were subjects who endorsed most, if not all, of the items given the range statistics. Additionally, the standard deviations show reasonable distribution of scores and resolution of the sample.

Percentile transformations are provided in Table 2. Percentile within the normative sample may be found by crossing the scale name row with the raw score column. For example, a subject with a raw score of 3 on the Confidence scale would be at the 2nd percentile of the normative sample. This subject would probably have a problem with confidence. A subject with a raw

score of 15 on the Alcohol Abuse scale would be in the top 99th percent of the sample. This subject would be exhibiting a very high level of alcohol use and be of great clinical concern.

Reliability

Internal consistencies are presented in Table 3. Here Cronbach alpha's have been calculated for each scale. In general, it is necessary to have internal consistencies at least in the .70's and preferably in the .80's (Nunnally, 1978). None are below .70 and 9 of the 15 scales are .80 or above. Of interest is the fact that the Alcohol Abuse scale has the highest internal consistency coefficient with a .89. This result is remarkable given the concern that subjects would be very wary of alcohol related items.

Item-total correlation ranges are presented in Table 4 and by item in Appendix B. These show the statistical quality of the items going into the scales and driving the internal consistency reliabilities. Again, the strongest numbers are seen for the Alcohol Abuse scale. The lowest item-totals are found on Confidence and Team Oriented. Again, during the selection of items for the final scales, items with lower item-total correlations were eliminated.

Internal Construct Validity

Table 5 provides the first validity analysis. This univariate intercorrelation matrix of the 15 scales indicates the degree of scale co-variance and overlap. It is desirable to have scales with relatively low intercorrelations to ensure scale specificity. Scales with higher correlations should be theoretically similar in content.

Across the matrix it is apparent that there is not undue scale overlap. Scales are relatively specific. Scales that are correlated are of similar content vein. For example, Confidence, Socialness, and Aggressiveness are all moderately correlated. This result is logical as social people are usually confident and assertive. The highest correlation in the matrix is between Orderliness and Organization. Again, this is appropriate in that those two dimensions are similar. Orderly individuals tend also to be organized. The .74 correlation for these two scales, however, is probably higher than is desirable.

Table 6 is a principal components analysis of the 15 ALAPS scales. This is done to determine the underlying dimensionality of the scales. The eigenvalues relatively cleanly suggest a four factor solution. The first factor encompasses the shared variance in the Confidence, Aggressiveness, and Risk Taking scales. The second factor appears to be an affective factor with Negativity, Affective Lability, Anxiety, and Depression loading highly. The third factor includes the highly correlated Orderliness and Organization scales. Finally, the fourth factor is a social factor with Socialness and Team Oriented scales. In

general, this is a very interpretable underlying factor structure. This and the univariate correlations suggest the ALAPS scales are internally valid.

External Construct Validity

The construction sample of the ALAPS also were administered the NEO-PI-R (Costa & McCrae, 1992). Table 7 provides the descriptive data for the NEO-PI-R. The data appears to be well behaved in this population. Indeed the internal consistency statistics are higher for this type of sample than those found in the NEO-PI-R manual. Correlations between the ALAPS scales and the five main NEO-PI-R scales are found in Table 8. The first NEO-PI-R scale, Neuroticism, is correlated with the affect oriented ALAPS scales, Negativity, Affective Lability, Anxiety, and Depression. The Extraversion scale is correlated with the ALAPS Socialness scale at a very high level. The Openness NEO-PI-R scale is somewhat more difficult to interpret and, interestingly, has no high correlations with ALAPS scales. The Agreeableness scale negatively correlates with the ALAPS Aggressiveness scale. Finally, the Conscientiousness scale correlates highest with the Organization scale and negatively with the Impulsivity scale. In general, these correlations are logical and of appropriate magnitude. These data support the external construct validity of the ALAPS scales.

Tables 9 through 13 provide the correlations between the ALAPS scales and the 30 subscales of the NEO-PI-R. Each of the 5 main NEO-PI-R scales have 6 subscales of similar but more focal content. These correlations provide a more narrow analysis of the construct validity of the ALAPS scales. In Table 9, it should be noted that the highest correlation with the NEO-PI-R Anxiety scale is with the ALAPS Anxiety scale. The highest correlation with Angry is with Negativity. The highest correlation with the NEO-PI-R Depression scale is with the ALAPS Depression scale. The NEO-PI-R Self-Conscious scale has no peer on the ALAPS. The Impulsive scale, again, has the highest correlation with the ALAPS Impulsiveness scale. Vulnerable has no complement in the ALAPS. All of these tables also include the relevant NEO-PI-R intercorrelation matrix which allows for an understanding of the specificity of the NEO-PI-R scales.

Similar convergence can be seen in the other tables whenever scales have similar names. For example, in Table 13 the NEO-PI-R Order scale correlates highest with the ALAPS Order scale. Indeed, the correlation here is .69 which is typical of these convergent validities and very strong. Again, construct validity for most of the ALAPS scales is seen.

As a multivariate approach to the external construct validity, a principal components analysis was done using the five main NEO-PI-R scales and the ALAPS scales. Table 14 shows the five factor solution. Factor One nicely encompasses the neurotic and affective elements of the two tests. Factor Two is an aggressive dimension with negative loadings for the NEO-PI-R

Agreeableness scale and positive for the ALAPS Confidence and Aggressive scales. Factor Three includes the NEO-PI-R Conscientiousness scale as well as the ALAPS Orderliness and Organization scales. Factor Four is anchored by the NEO-PI-R Openness scale and has positive loadings with the ALAPS Risk Taking scale and negative with the ALAPS Deference scale. Finally, the fifth factor has the Extraversion NEO-PI-R scale and higher loadings from the ALAPS Socialness and Team Oriented scales. In summary, this is a remarkably clean factor solution and supportive of the ALAPS dimensions.

In summary, the psychometrics of the ALAPS are very strong. The scales are highly internally consistent and as such highly reliable. The initial validity extimates against the NEO-PI-R are high and appropriate. The construction of the test has been rigorous and the statistics are highly supportive of its utility.

Future Research

At least two additional subject samples are necessary for this project. The first needs to be a cross-validation sample using Air Force student pilots. This sample is currently being collected. Norms, reliabilities, and validities must be re-calculated to ensure generalization of the current data.

The second additional sample must be a group of mid-career Air Force pilots. In order to use this test with the most confidence, a normative sample of fully qualified (rated) pilots is necessary. The easiest way to collect those data would be to work with Squadron Officer School (SOS) and collect the data there.

Additional samples of interest would include college students to determine the universality of these scales. Additionally, a group of ROTC students would show very early selection issues.

Additional construct validity studies are necessary. The use of the NEO-PI-R as the single external validity mechanism is adequate but less than compelling. Additional studies using other tests such as the Jackson Personality Inventory-Revised (Jackson, 1994) and Personality Research Form (Jackson, 1984) would be instructive. Further, "real world" peer rating or commander ratings would add evidence of validity. An easy project would be to have the Instructor Pilots in the USAF Enhanced Flight Screening program rate the student pilot subjects.

Test taking/response style studies would shed light on the problem of minimizing symptoms by ALAPS subjects. It is highly likely that in a number of situations pilots might take the ALAPS wishing to appear "perfect" and without flaw. This tendency is known as "impression management". Such a "fake good" style would impact the interpretability of the test for that subject. A group of college students could be used to take the test under a

number of simulated situations. Regression formulae could be developed to predict the style of pilot taking the ALAPS. Additionally, work should be done to model random response patterns. Some subjects may simply answer the test without reading the items. This end could be accomplished through the correlation of scale halves.

Selection, training, and occupational outcome studies are obviously of great interest in the military. Here prospective prediction of flight screening, initial pilot training, and advanced training would all be important. It may also be found that the crew interactions scales predict airframe success with team oriented personnel doing best in multicrew aircraft and confident, independent types doing best in single seat aircraft.

Finally, clinical studies will improve the mental health care of pilots. ALAPS scales may be useful in the diagnosis of manifestations of anxiety (MOA) in flight training. Mid-career pilots may have difficulty with depression or alcohol use. It may be useful even in marital or family therapy settings.

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Table 1

ALAPS Norms

Scale	MEAN	SD	Range
PERSONALITY (BEHAVIORAL STYLES)			
CONFIDENCE	9.7900	2.9238	2-16
SOCIALNESS	12.9050	3.3319	1-16
AGGRESSIVENESS	9.3450	2.8875	1-16
ORDERLINESS	12.4500	3.2512	0-16
NEGATIVITY	5.2700	3.0633	0-15
PSYCHOPATHOLOGY (COPING STYLES)			
AFFECTIVE LABILITY	5.0900	3.8452	0-16
ANXIETY	2.2400	3.0445	0-16
DEPRESSION	1.3300	1.9208	0-14
ALCOHOL ABUSE	7.2100	4.3231	0-16
CREW INTERACTION (INTERPERSONAL STYLES)			
DOGMATISM	5.9300	2.9782	0-14
DEFERENCE	6.3750	3.0841	0-15
TEAM ORIENTED	12.4000	3.4613	2-16
ORGANIZATION	12.8400	3.1582	0-16
IMPULSIVITY	7.0750	3.6956	0-16
RISK TAKING	12.0350	3.1565	2-16

note: N=200.

Table 2

ALAPS Percentile Conversion Table

	Raw Score																
Scale	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
CONFID	<	<	1	2	5	9	12	21	33	44	57	70	84	90	95	99	>
SOCIAL	<	1	2	3	5	6	7	10	12	14	18	22	30	43	60	82	>
AGGRES	<	1	2	3	5	9	16	24	37	53	68	77	86	92	97	99	>
ORDERC	<	<	1	3	5	6	7	8	10	17	22	29	39	51	68	91	>
NEGATI	4	9	20	30	43	57	72	79	86	90	94	96	98	99	>	>	>
AFFECT	5	19	33	43	53	64	70	74	77	85	90	93	95	97	98	99	>
ANXIET	42	58	69	77	81	85	88	92	93	97	98	99	>	>	>	>	>
DEPRES	44	69	83	90	94	96	98	99	>	>	>	>	>	>	>	>	>
ALCOHO	9	15	19	24	28	35	44	50	58	67	73	80	88	95	98	99	>
DOGMAT	2	7	13	20	32	47	63	71	82	91	93	95	97	99	>	>	>
DEFERE	1	4	8	18	30	44	56	68	77	85	91	93	95	97	99	>	>
TEAMOR	<	<	1	2	4	6	10	11	16	20	23	33	39	52	66	80	>
ORGANI	<	<	1	3	4	5	6	7	10	14	20	25	33	45	62	84	>
IMPULS	2	6	9	19	29	37	49	57	63	72	80	88	93	95	98	99	>
RISKTA	<	<	1	2	5	6	8	10	14	19	23	35	46	62	78	91	>

Table 3

ALAPS Scale Internal Consistencies (Reliabilities).

Scale	Alpha
CONFID	.71
SOCIAL	.85
AGGRES	.73
ORDERC	.83
NEGATI	.74
AFFECT	.85
ANXIET	.86
DEPRES	.76
ALCOHO	.89
DOGMAT	.73
DEFERE	.75
TEAMOR	.84
ORGANI	.83
IMPULS	.82
RISKTA	.80

Note: Alpha is a Cronbach Alpha internal consistency (reliability) statistic.

Table 4

Item-Total Correlation Coefficient Ranges.

Scale	Coefficient Range
CONFID	.27- .53
SOCIAL	.36- .76
AGGRES	.30- .58
ORDERC	.30- .70
NEGATI	.30- .62
AFFECT	.34- .74
ANXIET	.47- .73
DEPRES	.29- .62
ALCOHO	.48- .79
DOGMAT	.36- .55
DEFERE	.32- .59
TEAMOR	.27- .75
ORGANI	.35- .64
IMPULS	.38- .66
RISKTA	.33- .63

Table 5

ALAPS Intercorrelation Matrix

	CON	SOC	AGG	ORD	NEG	AFF	ANX	DEP	ALC	DOG	DEF	TEA	ORG	IMP	RIS
CONFID	-														
SOCIAL	43	-													
AGGRES	52	37	-												
ORDERC	-01	-01	-00	-											
NEGATI	-00	-11	30	02	-										
AFFECT	-24	03	04	-06	44	-									
ANXIET	-30	-13	-06	10	35	51	-								
DEPRES	-40	-35	-10	-00	43	47	48	-							
ALCOHO	19	25	24	-12	17	13	10	-03	-						
DOGMAT	20	08	28	09	44	15	20	19	14	-					
DEFERE	-30	-34	-27	18	14	02	24	27	-17	13	-				
TEAMOR	-01	40	02	-01	-20	00	-10	-09	07	-17	-20	-			
ORGANI	10	00	06	74	-09	-19	-03	-21	-19	-05	02	02	-		
IMPULS	18	23	26	-26	26	42	11	14	32	19	-15	-00	-35	-	
RISKTA	33	26	32	-16	11	10	-14	-08	25	14	-29	02	-08	49	-

Note: Decimals omitted.

Table 6

ALAPS Factor Structure

Rotated Factor Loadings

	FACTOR1	FACTOR2	FACTOR3	FACTOR4	H2
CONFID	0.722	-0.436	0.100	-0.050	0.724
SOCIAL	0.559	-0.111	0.079	0.588	0.676
AGGRES	0.776	-0.023	0.128	-0.036	0.620
ORDERC	-0.051	0.094	0.898	-0.018	0.817
NEGATI	0.362	0.606	0.034	-0.401	0.660
AFFECT	0.123	0.809	-0.154	0.140	0.712
ANXIET	-0.089	0.779	0.108	-0.055	0.629
DEPRES	-0.192	0.748	-0.117	-0.226	0.661
ALCOHO	0.477	0.178	-0.186	0.174	0.323
DOGMAT	0.486	0.299	0.142	-0.445	0.544
DEFERE	-0.386	0.262	0.170	-0.450	0.448
TEAMOR	-0.001	0.037	0.068	0.814	0.668
ORGANI	-0.022	-0.144	0.889	0.052	0.814
IMPULS	0.545	0.345	-0.433	0.086	0.611
RISKTA	0.628	-0.028	-0.235	0.076	0.456
Accounted for Variance	2.936	2.731	2.010	1.693	9.370
%	20	18	13	11	62

Note: H2 are the communalities which are the sum of the squared loadings for each variable. This statistic summarizes the quality of the solution's "fit" for each variable. For the purpose of scree analysis, the first 6 Eigenvalues are 3.123, 3.011, 1.888, 1.347, 0.894, and 0.793.

Table 7

NEO-PI-R Descriptive Statistics

Scale	Mean	SD	Range	Alpha
N Neuroticism	68.41	18.83	16 - 133	.91
E Extraversion	128.20	16.67	88 - 171	.90
O Openness	114.78	18.22	58 - 163	.88
A Agreeableness	113.98	16.66	68 - 159	.90
C Conscientiousnes	132.33	17.73	79 - 182	.92
N1 Anxiety	12.49	4.61	0 - 24	.77
N2 Angry Hostility	11.81	4.67	2 - 26	.76
N3 Depression	9.88	4.15	0 - 25	.79
N4 Self-Consciousness	12.92	4.41	0 - 25	.70
N5 Impulsivity	14.73	4.60	4 - 25	.72
N6 Vulnerability	6.57	3.49	0 - 19	.78
E1 Warmth	23.19	4.01	12 - 32	.76
E2 Gregariousness	19.35	4.81	5 - 30	.79
E3 Assertiveness	20.10	4.18	9 - 32	.77
E4 Activity	20.99	3.74	11 - 30	.62
E5 Excitement-Seeking	22.57	3.60	12 - 32	.63
E6 Positive Emotions	21.99	4.08	10 - 32	.76
O1 Fantasy	18.41	4.82	5 - 30	.81
O2 Aesthetics	16.77	5.55	1 - 29	.83
O3 Feelings	21.02	4.39	8 - 32	.74
O4 Actions	16.97	4.23	5 - 29	.61
O5 Ideas	22.33	4.65	5 - 32	.82
O6 Values	19.26	4.75	5 - 29	.72
A1 Trust	20.74	4.42	5 - 32	.84
A2 Straightforwardness	18.92	4.47	3 - 29	.72
A3 Altruism	23.49	3.68	11 - 32	.75
A4 Compliance	16.68	3.79	3 - 27	.66
A5 Modesty	16.23	4.67	2 - 29	.77
A6 Tender-Mindedness	17.90	4.00	5 - 28	.65
C1 Competence	24.60	3.32	15 - 32	.72
C2 Order	19.47	4.30	8 - 30	.75
C3 Dutifulness	24.13	3.68	12 - 32	.66
C4 Achievement Striving	23.59	3.75	12 - 32	.79
C5 Self-Discipline	22.75	4.32	11 - 32	.80
C6 Deliberation	17.79	4.35	6 - 30	.72

Note: Alpha is a Cronbach Alpha internal consistency (reliability) statistic. It is based on a sample of 1163 AF student pilots.

Table 8

Correlations Between ALAPS and NEO-PI-R Summary Scales.

	N Neuroticism	E Extraversion	O Openness	A Agreeableness	C Conscientiousness
CONFID	-0.3388	0.4762	0.0602	-0.4640	0.1765
SOCIAL	-0.2019	0.7102	0.2431	-0.1128	0.1045
AGGRES	-0.0318	0.3322	0.0490	-0.5423	0.0874
ORDERC	0.0565	-0.0645	-0.3252	0.0550	0.4264
NEGATI	0.5804	-0.1187	-0.0612	-0.4230	-0.1897
AFFECT	0.6124	0.0515	0.2211	-0.0234	-0.3434
ANXIET	0.5830	-0.1107	-0.1102	0.0082	-0.1081
DEPRES	0.5788	-0.3304	-0.0577	-0.0087	-0.3756
ALCOHO	0.1702	0.2035	0.1288	-0.3212	-0.1605
DOGMAT	0.2686	0.1442	-0.2593	-0.3992	-0.0431
DEFERE	0.2400	-0.3948	-0.3659	0.1380	-0.0843
TEAMOR	-0.0572	0.2864	0.1149	0.1431	0.0633
ORGANI	-0.1573	0.0087	-0.2307	0.0280	0.6053
IMPULS	0.3338	0.2179	0.2380	-0.2015	-0.5466
RISKTA	-0.0378	0.3495	0.2302	-0.2527	-0.1172
N	1.0000	-0.3226	-0.1428	-0.1853	-0.5253
E	-0.3226	1.0000	0.3612	-0.0644	0.2994
O	-0.1428	0.3612	1.0000	0.0407	-0.0735
A	-0.1853	-0.0644	0.0407	1.0000	0.1035
C	-0.5253	0.2994	-0.0735	0.1035	1.0000

Table 9

Correlations between ALAPS and NEO-PI-R Neuroticism Facet Scales.

	N1 Anxiety	N2 Angry	N3 Depression	N4 Self-Consc	N5 Impulsive	N6 Vulnerable
CONFID	-0.3468	-0.0228	-0.3638	-0.4221	0.0528	-0.4432
SOCIAL	-0.1170	-0.0089	-0.2925	-0.2877	0.0442	-0.2698
AGGRES	-0.0762	0.2871	-0.1010	-0.2523	0.0762	-0.1169
ORDERC	0.1149	0.1118	-0.0237	0.1122	-0.1254	0.0554
NEGATI	0.4438	0.6177	0.4730	0.2775	0.3488	0.3451
AFFECT	0.4591	0.4236	0.5452	0.3334	0.4405	0.4794
ANXIET	0.6133	0.3828	0.4498	0.3677	0.3246	0.3952
DEPRES	0.4661	0.2902	0.5505	0.4639	0.3315	0.4404
ALCOHO	0.1155	0.1606	0.0162	-0.0157	0.3803	0.0495
DOGMAT	0.1844	0.4091	0.1302	0.1109	0.2693	0.0078
DEFERE	0.2244	0.0782	0.2326	0.2504	0.0478	0.2378
TEAMOR	0.0361	-0.0513	-0.0879	-0.0561	-0.0710	-0.0184
ORGANI	-0.0940	0.0275	-0.1279	-0.1167	-0.2973	-0.0695
IMPULS	0.1081	0.2268	0.1928	0.1388	0.5316	0.2485
RISKTA	-0.1386	0.0182	-0.0649	-0.1344	0.2194	-0.0875
N1	1.0000	0.4426	0.5772	0.4285	0.3575	0.5423
N2	0.4426	1.0000	0.4445	0.3514	0.3581	0.3652
N3	0.5772	0.4445	1.0000	0.5625	0.3544	0.5956
N4	0.4285	0.3514	0.5625	1.0000	0.3263	0.5143
N5	0.3575	0.3581	0.3544	0.3263	1.0000	0.3325
N6	0.5423	0.3652	0.5956	0.5143	0.3325	1.0000

Table 10

Correlations between ALAPS and NEO-PI-R Extraversion Facet Scales.

	E1 Warmth	E2 Gregarious	E3 Assertive	E4 Activity	E5 Excitement	E6 Positive
CONFID	0.0561	0.2693	0.5761	0.4725	0.3324	0.2535
SOCIAL	0.5544	0.6630	0.5303	0.3065	0.3719	0.4188
AGGRES	-0.0076	0.2344	0.5187	0.3541	0.2246	0.0321
ORDERC	-0.0633	-0.0496	0.0729	0.0198	-0.1608	-0.0938
NEGATI	-0.2618	-0.0902	-0.0324	0.0366	0.0601	-0.1744
AFFECT	0.0847	0.1345	-0.1385	-0.0578	0.0814	0.0916
ANXIET	-0.0416	-0.0503	-0.1631	-0.0209	-0.0843	-0.0909
DEPRES	-0.2218	-0.1472	-0.3865	-0.2934	-0.1143	-0.1909
ALCOHO	-0.0180	0.2764	0.1572	0.0113	0.2548	0.1263
DOGMAT	0.0020	0.0402	0.1311	0.1660	0.2273	0.0517
DEFERE	-0.2037	-0.3431	-0.4095	-0.2987	-0.1484	-0.1819
TEAMOR	0.2834	0.5430	0.1496	-0.0706	0.0532	0.1146
ORGANI	-0.0268	-0.0330	0.1862	0.0992	-0.0868	-0.1046
IMPULS	0.0711	0.2159	0.0586	0.0933	0.2745	0.1773
RISKTA	0.0612	0.1773	0.2140	0.3517	0.4752	0.1959
E1	1.0000	0.4825	0.3055	0.1902	0.3142	0.5295
E2	0.4825	1.0000	0.3916	0.2109	0.4114	0.3859
E3	0.3055	0.3916	1.0000	0.5450	0.2985	0.2634
E4	0.1902	0.2109	0.5450	1.0000	0.2991	0.2615
E5	0.3142	0.4114	0.2985	0.2991	1.0000	0.4139
E6	0.5295	0.3859	0.2634	0.2615	0.4139	1.0000

Table 11

Correlations between ALAPS and NEO-PI-R Openness Facet Scales.

	O1 Fantasy	O2 Aesthetics	O3 Feelings	O4 Actions	O5 Ideas	O6 Values
CONFID	0.0422	-0.1746	0.0933	0.1131	0.2079	0.0011
SOCIAL	0.2154	0.0545	0.3502	0.1475	0.1747	0.0229
AGGRES	0.0308	-0.1348	0.1415	0.0483	0.0848	0.0570
ORDERC	-0.2792	-0.1927	-0.1760	-0.2135	-0.1378	-0.2501
NEGATI	0.0784	-0.1337	0.1816	-0.0962	-0.1234	-0.1192
AFFECT	0.2445	0.2284	0.5302	-0.0569	-0.0466	-0.0615
ANXIET	-0.0356	-0.0826	0.0946	-0.1385	-0.1475	-0.1093
DEPRES	0.0670	0.0178	0.0254	-0.1816	-0.0934	-0.0801
ALCOHO	0.1517	-0.0058	0.1549	0.0263	0.0492	0.1318
DOGMAT	0.0839	-0.3086	0.0646	-0.2807	-0.1027	-0.4273
DEFERE	-0.1770	-0.1575	-0.2906	-0.3482	-0.2832	-0.1824
TEAMOR	0.0327	0.0849	0.1488	0.0621	0.0112	0.1038
ORGANI	-0.2608	-0.1741	-0.1770	-0.1043	-0.0507	-0.1097
IMPULS	0.3083	0.0870	0.3016	0.1387	-0.0158	0.1108
RISKTA	0.2644	0.1062	0.1487	0.2032	0.1165	0.0573
O1	1.0000	0.3829	0.4264	0.2514	0.2898	0.1495
O2	0.3829	1.0000	0.4348	0.3485	0.4181	0.2428
O3	0.4264	0.4348	1.0000	0.1647	0.2682	0.1397
O4	0.2514	0.3485	0.1647	1.0000	0.3172	0.2695
O5	0.2898	0.4181	0.2682	0.3172	1.0000	0.2066
O6	0.1495	0.2428	0.1397	0.2695	0.2066	1.0000

Table 12

Correlations between ALAPS and NEO-PI-R Agreeable Facet Scales.

	A1 Trust	A2 Straightforward	A3 Altruism	A4 Compliance	A5 Modesty	A6 Tender
CONFID	-0.1025	-0.4302	-0.2203	-0.4400	-0.4858	-0.1507
SOCIAL	0.1068	-0.2121	0.1766	-0.2085	-0.2504	-0.0229
AGGRES	-0.2838	-0.4557	-0.2764	-0.6129	-0.3667	-0.1715
ORDERC	-0.0933	0.1522	0.0384	0.0566	0.0774	-0.0176
NEGATI	-0.5085	-0.2536	-0.3137	-0.3855	-0.1180	-0.1241
AFFECT	-0.1886	-0.0233	0.0337	-0.0201	0.0575	0.0577
ANXIET	-0.1346	0.0655	-0.0218	-0.0090	0.0822	0.0423
DEPRES	-0.2089	0.0543	-0.0814	0.0498	0.0983	0.0466
ALCOHO	-0.0842	-0.2662	-0.1766	-0.3001	-0.2071	-0.2582
DOGMAT	-0.2462	-0.2504	-0.1319	-0.4048	-0.3126	-0.2400
DEFERE	-0.0022	0.1750	-0.0628	0.1204	0.2190	0.0693
TEAMOR	0.1700	0.0675	0.1711	0.1240	0.0399	0.0109
ORGANI	-0.0299	0.0635	0.0707	0.0289	0.0093	-0.0247
IMPULS	-0.0852	-0.2327	-0.0965	-0.2171	-0.1173	-0.0532
RISKTA	0.0017	-0.2406	-0.0801	-0.2674	-0.2187	-0.2026
A1	1.0000	0.2884	0.4644	0.3907	0.1925	0.1738
A2	0.2884	1.0000	0.3990	0.4926	0.4081	0.2238
A3	0.4644	0.3990	1.0000	0.3758	0.2989	0.2792
A4	0.3907	0.4926	0.3758	1.0000	0.4105	0.2603
A5	0.1925	0.4081	0.2989	0.4105	1.0000	0.3233
A6	0.1738	0.2238	0.2792	0.2603	0.3233	1.0000

Table 13

Correlations between ALAPS and NEO-PI-R Conscientiousness Facet Scales.

	C1 Competence	C2 Order	C3 Dutifulness	C4 Achievement	C5 Discipline	C6 Deliberation
CONFID	0.3108	0.0741	0.0757	0.3722	0.1395	-0.1155
SOCIAL	0.1987	0.0304	0.0153	0.2658	0.0962	-0.0942
AGGRES	0.1018	0.0378	0.0373	0.3021	0.0491	-0.1001
ORDERC	0.2176	0.6851	0.2021	0.1887	0.2790	0.2813
NEGATI	-0.2706	-0.0451	-0.0952	0.0284	-0.2207	-0.2461
AFFECT	-0.3266	-0.1133	-0.2644	-0.1810	-0.3476	-0.3114
ANXIET	-0.1840	-0.0117	-0.1200	-0.0010	-0.1464	-0.0401
DEPRES	-0.3663	-0.2187	-0.2146	-0.3251	-0.4161	-0.1580
ALCOHO	-0.0478	-0.0852	-0.1501	0.0709	-0.1049	-0.3626
DOGMAT	0.0500	0.0179	-0.0234	0.1398	-0.1347	-0.1983
DEFERE	-0.1881	0.0271	-0.0379	-0.1709	-0.1450	0.0971
TEAMOR	0.0402	-0.0472	0.0660	0.0002	0.1120	0.1064
ORGANI	0.3629	0.6777	0.2782	0.3895	0.5127	0.4362
IMPULS	-0.3629	-0.2337	-0.4076	-0.1968	-0.4634	-0.7421
RISKTA	-0.0586	-0.0378	-0.0850	0.1177	-0.0722	-0.3528
C1	1.0000	0.4004	0.5716	0.5480	0.6448	0.3989
C2	0.4004	1.0000	0.3590	0.3728	0.4883	0.3270
C3	0.5716	0.3590	1.0000	0.4870	0.6146	0.4260
C4	0.5480	0.3728	0.4870	1.0000	0.6182	0.3173
C5	0.6448	0.4883	0.6146	0.6182	1.0000	0.5029
C6	0.3989	0.3270	0.4260	0.3173	0.5029	1.0000

Table 14

Factor Solution for ALAPS and NEO-PI-R Summary Scales.

Rotated Factor Loadings

	FACTOR1	FACTOR2	FACTOR3	FACTOR4	FACTOR5
N	0.836	0.116	-0.198	-0.218	-0.062
E	-0.156	0.270	0.137	0.481	0.623
O	0.028	-0.158	-0.183	0.809	0.079
A	-0.023	-0.808	0.077	0.006	0.130
C	-0.340	-0.026	0.796	0.068	0.085
CONFID	-0.430	0.675	0.079	0.214	0.164
SOCIAL	-0.141	0.284	0.036	0.275	0.777
AGGRES	-0.034	0.739	0.094	0.223	0.135
ORDERC	0.150	0.029	0.805	-0.236	0.032
NEGATI	0.615	0.497	-0.014	-0.032	-0.231
AFFECT	0.821	0.001	-0.120	0.284	0.089
ANXIET	0.765	-0.034	0.099	-0.132	0.034
DEPRES	0.724	-0.082	-0.157	-0.134	-0.236
ALCOHO	0.125	0.404	-0.267	0.062	0.325
DOGMAT	0.266	0.640	0.021	-0.294	0.042
DEFERE	0.231	-0.136	0.024	-0.631	-0.201
TEAMOR	-0.030	-0.211	-0.019	-0.016	0.780
ORGANI	-0.072	0.019	0.888	-0.047	-0.018
IMPULS	0.345	0.361	-0.479	0.344	0.157
RISKTA	-0.008	0.436	-0.158	0.509	0.067
Variance	3.495	3.060	2.559	2.150	1.976
%	17	15	13	11	10

Note: Total percentage of variance accounted for is 66%. The first 8 Eigenvalues were 4.195, 3.886, 2.462, 1.681, 1.018, 0.906, 0.881, and 0.784.

Appendix B

ALAPS Items within Scales with Proportion Keyed Responses and Item-Total Correlations. False keyed items are denoted by (F).

Text	new#	old#	Prop.	Item -Total
Confidence (Narcissism)				
01. I am very good at just about everything.	001	1	0.69	0.41
02. I do almost everything extremely well.	016	19	0.61	0.43
03. Sometimes I act in a fairly arrogant manner.	031	73	0.55	0.41
04. I will probably become one of the very best in my career.	046	109	0.86	0.40
05. Sometimes I take advantage of others.	061	199	0.25	0.28
06. I live by my own ideas.	076	217	0.76	0.27
07. Some people think of me as conceited and egotistical.	091	235	0.31	0.52
08. I'm probably smarter than most people.	106	271	0.68	0.46
09. I have a great deal of confidence.	121	289	0.95	0.43
10. People think of me as fairly humble. (F)	136	307	0.26	0.50
11. I am modest when I speak of my accomplishments.(F)	151	325	0.17	0.26
12. I am self-conscious in groups of people.(F)	166	343	0.60	0.44
13. I wish that I had more self-confidence. (F)	181	361	0.67	0.52
14. I get embarrassed easily.(F)	196	379	0.79	0.48
15. Others seem more sure of themselves than I am.(F)	211	397	0.78	0.53
16. I think that I lack "backbone" in some situations.(F)	226	415	0.82	0.44
Socialness				
01. I fit in to new groups of people easily.	002	38	0.85	0.59
02. I have many friends.	017	56	0.88	0.57
03. I need to be around people.	032	74	0.48	0.35
04. I like to flirt.	047	92	0.76	0.35
05. People see me as friendly and talkative.	062	110	0.81	0.56
06. I am charming.	077	128	0.88	0.48
07. I can make new friends easily.	092	182	0.89	0.72
08. I like to socialize with everyone at work.	107	236	0.72	0.57
09. I like parties.	122	254	0.89	0.51

10. I spend most of my time with other people.	137	272	0.72	0.64
11. I am a pretty social person.	152	290	0.88	0.75
12. I am pretty much of a loner.(F)	167	308	0.85	0.56
13. I feel uncomfortable in a lot of social situations.(F)	182	326	0.79	0.59
14. I try to keep to myself.(F)	197	344	0.81	0.55
15. I am not very talkative.(F)	212	362	0.77	0.62
16. I really feel uncomfortable at parties.(F)	227	416	0.89	0.37

Aggressiveness

01. I tend to argue with people.	003	21	0.25	0.45
02. I like to "get even" when others deserve it.	018	57	0.37	0.40
03. Others tend to be too submissive.	033	75	0.40	0.40
04. I like to stand up for myself.	048	93	0.94	0.34
05. Sometimes, I am too blunt with others.	063	147	0.52	0.57
06. Some people think that I am too pushy.	078	165	0.29	0.58
07. I have threatened others when necessary.	093	183	0.31	0.52
08. Nobody is going to walk all over me.	108	201	0.91	0.33
09. You have to stand up for yourself most of the time.	123	219	0.80	0.30
10. I am fairly assertive.	138	237	0.92	0.45
11. I am aggressive.	153	255	0.88	0.51
12. If I am annoyed by someone, I will let them know.	168	273	0.48	0.55
13. I will fight for what I want.	183	291	0.94	0.38
14. I cooperate with everyone.(F)	198	309	0.34	0.39
15. Life is too short to fight with people.(F)	213	381	0.29	0.40
16. I wish that I were more assertive.(F)	228	399	0.67	0.35

Orderliness (Compulsivity)

01. I like things to be orderly.	004	4	0.93	0.66
02. Order is important in my life.	019	22	0.88	0.65
03. Everything should be in its place.	034	58	0.75	0.69
04. I like a very clean place.	049	76	0.75	0.66
05. Clutter bothers me.	064	94	0.70	0.57
06. I am pretty neat and orderly.	079	112	0.85	0.70
07. I am tidy.	094	130	0.72	0.68
08. I like to be disciplined in my life.	109	148	0.93	0.30
09. I am a very consistent person.	124	184	0.91	0.39
10. I just like to clean.	139	202	0.22	0.42
11. I am fairly methodical.	154	220	0.87	0.29
12. Schedules keep me on track.	169	238	0.84	0.41
13. I like a lot of structure in what I do.	184	274	0.78	0.65

14. I am perfectionistic.	199	292	0.70	0.51
15. I am very conscientious about everything.	214	310	0.72	0.34
16. I am pretty messy by nature.(F)	229	364	0.86	0.54

Negativity (Passive-Aggression)

01. I can be a little negative about people.	005	5	0.73	0.48
02. I tend to get cynical about life.	020	59	0.18	0.48
03. I grumble about things.	035	77	0.34	0.62
04. I can be pretty hard on other people.	050	95	0.52	0.47
05. Others tend to get more than they deserve.	065	113	0.21	0.34
06. Too many get ahead without working.	080	131	0.45	0.45
07. People don't really understand me.	095	149	0.29	0.44
08. Others tend to criticize me.	110	185	0.13	0.50
09. I can get touchy.	125	203	0.56	0.46
10. People just irritate me sometimes.	140	221	0.64	0.58
11. Life can be disillusioning.	155	257	0.51	0.47
12. I am an optimist.(F)	170	293	0.10	0.40
13. Things always work out in the end.(F)	185	311	0.12	0.29
14. People tell me that I am a very positive person.(F)	200	383	0.19	0.44
15. I treat everyone nicely.(F)	215	401	0.13	0.37
16. The world is generally a good place.(F)	230	419	0.12	0.31

Affective Lability

01. My moods tend to vary a great deal.	006	6	0.23	0.63
02. My moods tend to go up and down.	021	24	0.31	0.66
03. I can be pretty emotional.	036	42	0.43	0.73
04. I can get pretty excited when things start happening fast.	051	60	0.65	0.36
05. At times things scare me.	066	78	0.41	0.42
06. Sadness can strike me pretty quickly.	081	132	0.12	0.61
07. I am an emotional person.	096	150	0.47	0.67
08. My emotions can get the better of me.	111	168	0.22	0.63
09. My emotions sometimes carry me away.	126	186	0.17	0.62
10. I am emotionally more sensitive than most.	141	204	0.27	0.56
11. Things like tests scare me.	156	222	0.16	0.34
12. Sometimes, I wish my moods were more controlled.	171	276	0.17	0.59
13. Nobody has ever called me "moody".(F)	186	294	0.49	0.35
14. My emotions are rock solid.(F)	201	312	0.33	0.59
15. I am not a very emotional person.(F)	216	330	0.51	0.60
16. I am a very calm person.(F)	231	384	0.11	0.35

Anxiety

01. I am anxious much of the time.	007	7	0.23	0.53
02. I am more anxious than most people.	022	25	0.26	0.73
03. I worry about things a lot.	037	43	0.20	0.65
04. I spend too much time being anxious.	052	151	0.09	0.56
05. I wish I were as calm and cool as some of my friends.	067	169	0.22	0.51
06. I have been very tense lately.	082	205	0.08	0.51
07. The stress in my life is making me anxious.	097	223	0.06	0.52
08. I am just a worrier.	112	259	0.08	0.47
09. I worry about things long after they are over.	127	277	0.18	0.50
10. Sometimes I get so anxious I have trouble thinking.	142	295	0.07	0.52
11. Anxiety at times gets in my way.	157	313	0.16	0.51
12. I get nervous more than I should.	172	331	0.19	0.65
13. I could work better if I weren't so anxious.	187	349	0.06	0.56
14. People say that I get too nervous.	202	367	0.06	0.57
15. My nerves have gotten the better of me.	217	403	0.06	0.47
16. Being nervous is just part of me.	232	421	0.19	0.68

Depression

01. I feel sad a lot lately.	008	44	0.04	0.61
02. I am not sleeping well due to stress.	023	62	0.05	0.38
03. I am feeling guilty about things.	038	98	0.12	0.50
04. My energy is down.	053	116	0.07	0.53
05. I am finding it difficult to concentrate.	068	134	0.10	0.56
06. My appetite isn't what it used to be.	083	152	0.16	0.30
07. I tend to just sit and stare.	098	188	0.08	0.48
08. I feel helpless sometimes.	113	206	0.12	0.47
09. I feel pretty pessimistic about the future.	128	260	0.06	0.28
10. I didn't used to be this depressed and blue.	143	278	0.02	0.37
11. Little excites me these days.	158	332	0.07	0.35
12. My friends think that I am depressed.	173	350	0.02	0.50
13. I used to be a lot happier.	188	368	0.03	0.44
14. I wish that I were more happy than I am.	203	386	0.14	0.57
15. I used to be a happier person.	218	404	0.03	0.50
16. I find some things just very depressing.	233	422	0.19	0.45

Alcohol Abuse

01. I like to drink alcohol.	009	10	0.61	0.78
02. I have drunk more than my share of beer.	024	28	0.33	0.69
03. Drinking is all right while you are young and healthy.	039	136	0.39	0.60
04. I like to drink at a favorite place.	054	154	0.33	0.54
05. When I'm not working, I like to drink beer:	069	172	0.20	0.49
06. There have been times when I should have cut down on my drinking.	084	190	0.27	0.56
07. Drinking wine is good for the soul.	099	226	0.24	0.50
08. I have done things while drunk that I regret.	114	244	0.45	0.63
09. I have drunk so much on occasion that I have passed out.	129	262	0.21	0.53
10. I worry about getting a drunk driving ticket.	144	280	0.13	0.48
11. I do not drink alcohol.(F)	159	298	0.83	0.67
12. I dislike the taste of alcohol.(F)	174	316	0.79	0.66
13. I don't like to be around people who drink.(F)	189	352	0.83	0.58
14. Drinking is not for me.(F)	204	370	0.70	0.77
15. Alcohol is not attractive to me.(F)	219	406	0.63	0.77
16. I could live the rest of my life never having another drink.(F)	234	424	0.24	0.50

Dogmatism (Authoritarianism)

01. I like people who are different from me. (F)	010	29	0.20	0.39
02. I size people up pretty quickly.	025	65	0.72	0.46
03. My way to do things is usually best.	040	119	0.57	0.43
04. I prefer to talk with people who pretty much agree with me.	055	137	0.48	0.38
05. I know who I like very quickly after meeting them.	070	155	0.74	0.47
06. I find it difficult to tolerate people I don't like.	085	173	0.48	0.43
07. Some people have pretty stupid beliefs.	100	191	0.57	0.51
08. I accept most everyone regardless of beliefs or ideas. (F)	115	209	0.17	0.43
09. I am always open to new ideas. (F)	130	227	0.14	0.42
10. People think of me as open-minded and flexible. (F)	145	245	0.15	0.45
11. Frankly, I am a little intolerant of other people and their ideas.	160	263	0.12	0.41
12. I have been accused of being narrow-minded.	175	299	0.29	0.55
13. A lot of people need help figuring life out.	190	353	0.68	0.35
14. I like to hear many other approaches	205	371	0.13	0.47

to doing things.(F)				
15. I am open to all new approaches to accomplishing projects.(F)	220	407	0.08	0.41
16. Too much compromise is for losers.	235	425	0.38	0.43

Deference (Submissiveness)

01. I do what I am told.	011	12	0.93	0.36
02. Who ever is in charge is in charge.	026	30	0.70	0.46
03. The boss is always right.	041	48	0.09	0.31
04. I keep my mouth shut on the job to avoid trouble.	056	66	0.28	0.52
05. I defer to those in charge.	071	84	0.53	0.41
06. My job is to do what is expected of me.	086	102	0.63	0.53
07. I usually don't express my opinions to my boss.	101	120	0.18	0.40
08. I don't usually question those in charge.	116	156	0.60	0.59
09. I am comfortable just doing my job.	131	192	0.38	0.44
10. I don't question leaders.	146	210	0.21	0.56
11. It isn't my job to question others work.	161	228	0.19	0.44
12. I concentrate only on my own job.	176	264	0.19	0.47
13. Everyone should concentrate on their own job.	191	282	0.53	0.51
14. I like to question authority.(F)	206	354	0.60	0.40
15. I prefer not to be the boss.	221	372	0.08	0.39
16. I like it when someone else takes charge.	236	390	0.20	0.39

Team Oriented

01. It takes a team to get most things done.	012	31	0.78	0.43
02. I prefer to work in a team.	027	67	0.84	0.62
03. I prefer to work alone. (F)	042	103	0.72	0.74
04. I work best alone. (F)	057	121	0.70	0.73
05. I am most efficient working alone. (F)	072	139	0.53	0.66
06. People I work with often get in the way. (F)	087	157	0.84	0.36
07. Team work is always important.	102	175	0.90	0.31
08. A team orientation at work is important	117	013	0.96	0.27
09. I am independent in my work. (F)	132	265	0.36	0.50
10. I like to bounce work ideas off others.	147	283	0.90	0.34
11. I like group projects.	162	319	0.84	0.70
12. I prefer to work with others.	177	337	0.78	0.71
13. I like to share the work and the credit with others.	192	355	0.91	0.39
14. My best ideas come when working with	207	391	0.71	0.69

others.				
15. It takes a team to win.	222	409	0.84	0.46
16. I like to have others around when I work.	237	427	0.76	0.63

Organization

01. I am an organized person.	013	15	0.90	0.63
02. Others say that I organize things well.	028	33	0.89	0.52
03. Organization is one of my strengths.	043	51	0.85	0.62
04. I like to plan things out.	058	69	0.89	0.50
05. I like to have a schedule for each day.	073	87	0.60	0.50
06. I am fairly methodical about my work.	088	105	0.84	0.49
07. I like a good system to get things done.	103	123	0.94	0.38
08. I tend to lose things.(F)	118	159	0.85	0.59
09. I am a little disorganized.(F)	133	177	0.67	0.63
10. I get a little absent minded. (F)	148	195	0.61	0.47
11. I often must look for things that I have mislaid.(F)	163	303	0.79	0.52
12. I am fairly methodical day to day.	178	321	0.75	0.58
13. I have a list of things "to do" each day.	193	339	0.56	0.46
14. I have a system to get most things done.	208	357	0.81	0.60
15. I do everything as thoroughly as possible.	223	375	0.90	0.53
16. Projects should always be well coordinated.	238	411	0.93	0.35

Impulsivity

01. I am a little impulsive.	014	16	0.77	0.55
02. I tend to act too quickly on things sometimes.	029	34	0.44	0.65
03. I often talk before I think.	044	52	0.23	0.50
04. I have gotten in trouble for blurting things out.	059	70	0.39	0.54
05. I am a little hasty sometimes.	074	88	0.57	0.63
06. I am spontaneous.	089	124	0.72	0.55
07. I have done foolhardy things.	104	142	0.69	0.55
08. I am not a very cautious person.	119	160	0.20	0.43
09. I wish I thought things through a little better.	134	178	0.28	0.45
10. I am a little too impetuous.	149	196	0.17	0.37
11. I like to think thoroughly before acting.(F)	164	232	0.22	0.50
12. I like to be completely sure before I act. (F)	179	250	0.38	0.48

13. I do nothing without thinking first.(F)	194	268	0.59	0.46
14. People say that I am too impulsive.	209	286	0.11	0.48
15. I am more spontaneous than most of my friends.	224	304	0.54	0.48
16. I like to do things on the spur of the moment.	239	322	0.74	0.54

Risk Taking

01. I like to take risks.	015	18	0.75	0.62
02. I am pretty cautious in life.(F)	030	72	0.40	0.52
03. I am fairly wary of risky situations.(F)	045	108	0.51	0.56
04. I am unafraid of hurting myself.	060	126	0.42	0.37
05. You can't go through life afraid of danger.	075	144	0.91	0.32
06. Dangerous situations just aren't worth the risk.(F)	090	162	0.78	0.46
07. I tend to like dangerous hobbies.	105	180	0.59	0.61
08. I have placed myself in danger in the past.	120	216	0.87	0.39
09. I would like to be a skydiver.	135	234	0.76	0.59
10. I think it would be fun to be a race car driver.	150	252	0.90	0.44
11. I like to drive fast.	165	270	0.82	0.46
12. I like adventurous hobbies.	180	288	0.91	0.54
13. I would like sports like rock climbing.	195	342	0.77	0.58
14. I avoid activities with risk involved. (F)	210	360	0.90	0.52
15. I am likely to try almost anything once.	225	378	0.81	0.47
16. I'll accept some risk as long as there's the chance I'll have fun.	240	414	0.89	0.45

Appendix C

ALAPS Items in Test Format

T F 1. I am very good at just about everything.
T F 2. I fit in to new groups of people easily.
T F 3. I tend to argue with people.
T F 4. I like things to be orderly.
T F 5. I can be a little negative about people.
T F 6. My moods tend to vary a great deal.
T F 7. I am anxious much of the time.
T F 8. I feel sad a lot lately.
T F 9. I like to drink alcohol.
T F 10. I like people who are different from me.
T F 11. I do what I am told.
T F 12. It takes a team to get most things done.
T F 13. I am an organized person.
T F 14. I am a little impulsive.
T F 15. I like to take risks.
T F 16. I do almost everything extremely well.
T F 17. I have many friends.
T F 18. I like to "get even" when others deserve it.
T F 19. Order is important in my life.
T F 20. I tend to get cynical about life.
T F 21. My moods tend to go up and down.
T F 22. I am more anxious than most people.
T F 23. I am not sleeping well due to stress.
T F 24. I have drunk more than my share of beer.
T F 25. I size people up pretty quickly.
T F 26. Who ever is in charge is in charge.
T F 27. I prefer to work in a team.
T F 28. Others say that I organize things well.
T F 29. I tend to act too quickly on things sometimes.
T F 30. I am pretty cautious in life.
T F 31. Sometimes I act in a fairly arrogant manner.
T F 32. I need to be around people.
T F 33. Others tend to be too submissive.
T F 34. Everything should be in its place.
T F 35. I grumble about things.
T F 36. I can be pretty emotional.
T F 37. I worry about things a lot.
T F 38. I am feeling guilty about things.
T F 39. Drinking is all right while you are young and healthy.
T F 40. My way to do things is usually best.
T F 41. The boss is always right.
T F 42. I prefer to work alone.
T F 43. Organization is one of my strengths.
T F 44. I often talk before I think.
T F 45. I am fairly wary of risky situations.
T F 46. I will probably become one of the very best in my career.
T F 47. I like to flirt.
T F 48. I like to stand up for myself.
T F 49. I like a very clean place.
T F 50. I can be pretty hard on other people.

T F 51. I can get pretty excited when things start happening fast.
T F 52. I spend too much time being anxious.
T F 53. My energy is down.
T F 54. I like to drink at a favorite place.
T F 55. I prefer to talk with people who pretty much agree with me.
T F 56. I keep my mouth shut on the job to avoid trouble.
T F 57. I work best alone.
T F 58. I like to plan things out.
T F 59. I have gotten in trouble for blurting things out.
T F 60. I am unafraid of hurting myself.
T F 61. Sometimes I take advantage of others.
T F 62. People see me as friendly and talkative.
T F 63. Sometimes, I am too blunt with others.
T F 64. Clutter bothers me.
T F 65. Others tend to get more than they deserve.
T F 66. At times things scare me.
T F 67. I wish I were as calm and cool as some of my friends.
T F 68. I am finding it difficult to concentrate.
T F 69. When I'm not working, I like to drink beer.
T F 70. I know who I like very quickly after meeting them.
T F 71. I defer to those in charge.
T F 72. I am most efficient working alone.
T F 73. I like to have a schedule for each day.
T F 74. I am a little hasty sometimes.
T F 75. You can't go through life afraid of danger.
T F 76. I live by my own ideas.
T F 77. I am charming.
T F 78. Some people think that I am too pushy.
T F 79. I am pretty neat and orderly.
T F 80. Too many get ahead without working.
T F 81. Sadness can strike me pretty quickly.
T F 82. I have been very tense lately.
T F 83. My appetite isn't what it used to be.
T F 84. There have been times when I should have cut down on my drinking.
T F 85. I find it difficult to tolerate people I don't like.
T F 86. My job is to do what is expected of me.
T F 87. People I work with often get in the way.
T F 88. I am fairly methodical about my work.
T F 89. I am spontaneous.
T F 90. Dangerous situations just aren't worth the risk.
T F 91. Some people think of me as conceited and egotistical.
T F 92. I can make new friends easily.
T F 93. I have threatened others when necessary.
T F 94. I am tidy.
T F 95. People don't really understand me.
T F 96. I am an emotional person.
T F 97. The stress in my life is making me anxious.
T F 98. I tend to just sit and stare.
T F 99. Drinking wine is good for the soul.
T F 100. Some people have pretty stupid beliefs.

T F 101. I usually don't express my opinions to my boss.
T F 102. Team work is always important.
T F 103. I like a good system to get things done.
T F 104. I have done foolhardy things.
T F 105. I tend to like dangerous hobbies.
T F 106. I'm probably smarter than most people.
T F 107. I like to socialize with everyone at work.
T F 108. Nobody is going to walk all over me.
T F 109. I like to be disciplined in my life.
T F 110. Others tend to criticize me.
T F 111. My emotions can get the better of me.
T F 112. I am just a worrier.
T F 113. I feel helpless sometimes.
T F 114. I have done things while drunk that I regret.
T F 115. I accept most everyone regardless of beliefs or ideas.
T F 116. I don't usually question those in charge.
T F 117. A team orientation at work is important.
T F 118. I tend to lose things.
T F 119. I am not a very cautious person.
T F 120. I have placed myself in danger in the past.
T F 121. I have a great deal of confidence.
T F 122. I like parties.
T F 123. You have to stand up for yourself most of the time.
T F 124. I am a very consistent person.
T F 125. I can get touchy.
T F 126. My emotions sometimes carry me away.
T F 127. I worry about things long after they are over.
T F 128. I feel pretty pessimistic about the future.
T F 129. I have drunk so much on occasion that I have passed out.
T F 130. I am always open to new ideas.
T F 131. I am comfortable just doing my job.
T F 132. I am independent in my work.
T F 133. I am a little disorganized.
T F 134. I wish I thought things through a little better.
T F 135. I would like to be a skydiver.
T F 136. People think of me as fairly humble.
T F 137. I spend most of my time with other people.
T F 138. I am fairly assertive.
T F 139. I just like to clean.
T F 140. People just irritate me sometimes.
T F 141. I am emotionally more sensitive than most.
T F 142. Sometimes I get so anxious I have trouble thinking.
T F 143. I didn't used to be this depressed and blue.
T F 144. I worry about getting a drunk driving ticket.
T F 145. People think of me as open-minded and flexible.
T F 146. I don't question leaders.
T F 147. I like to bounce work ideas off others.
T F 148. I get a little absent minded.
T F 149. I am a little too impetuous.
T F 150. I think it would be fun to be a race car driver.

T F 151. I am modest when I speak of my accomplishments.
T F 152. I am a pretty social person.
T F 153. I am aggressive.
T F 154. I am fairly methodical.
T F 155. Life can be disillusioning.
T F 156. Things like tests scare me.
T F 157. Anxiety at times gets in my way.
T F 158. Little excites me these days.
T F 159. I do not drink alcohol.
T F 160. Frankly, I am a little intolerant of other people and their ideas.
T F 161. It isn't my job to question others work.
T F 162. I like group projects.
T F 163. I often must look for things that I have mislaid.
T F 164. I like to think thoroughly before acting.
T F 165. I like to drive fast.
T F 166. I am self-conscious in groups of people.
T F 167. I am pretty much of a loner.
T F 168. If I am annoyed by someone, I will let them know.
T F 169. Schedules keep me on track.
T F 170. I am an optimist.
T F 171. Sometimes, I wish my moods were more controlled.
T F 172. I get nervous more than I should.
T F 173. My friends think that I am depressed.
T F 174. I dislike the taste of alcohol.
T F 175. I have been accused of being narrow-minded.
T F 176. I concentrate only on my own job.
T F 177. I prefer to work with others.
T F 178. I am fairly methodical day to day.
T F 179. I like to be completely sure before I act.
T F 180. I like adventurous hobbies.
T F 181. I wish that I had more self-confidence.
T F 182. I feel uncomfortable in a lot of social situations.
T F 183. I will fight for what I want.
T F 184. I like a lot of structure in what I do.
T F 185. Things always work out in the end.
T F 186. Nobody has ever called me "moody".
T F 187. I could work better if I weren't so anxious.
T F 188. I used to be a lot happier.
T F 189. I don't like to be around people who drink.
T F 190. A lot of people need help figuring life out.
T F 191. Everyone should concentrate on their own job.
T F 192. I like to share the work and the credit with others.
T F 193. I have a list of things "to do" each day.
T F 194. I do nothing without thinking first.
T F 195. I would like sports like rock climbing.
T F 196. I get embarrassed easily.
T F 197. I try to keep to myself.
T F 198. I cooperate with everyone.
T F 199. I am perfectionistic.
T F 200. People tell me that I am a very positive person.

T F 201. My emotions are rock solid.
T F 202. People say that I get too nervous.
T F 203. I wish that I were more happy than I am.
T F 204. Drinking is not for me.
T F 205. I like to hear many other approaches to doing things.
T F 206. I like to question authority.
T F 207. My best ideas come when working with others.
T F 208. I have a system to get most things done.
T F 209. People say that I am too impulsive.
T F 210. I avoid activities with risk involved.
T F 211. Others seem more sure of themselves than I am.
T F 212. I am not very talkative.
T F 213. Life is too short to fight with people.
T F 214. I am very conscientious about everything.
T F 215. I treat everyone nicely.
T F 216. I am not a very emotional person.
T F 217. My nerves have gotten the better of me.
T F 218. I used to be a happier person.
T F 219. Alcohol is not attractive to me.
T F 220. I am open to all new approaches to accomplishing projects.
T F 221. I prefer not to be the boss.
T F 222. It takes a team to win.
T F 223. I do everything as thoroughly as possible.
T F 224. I am more spontaneous than most of my friends.
T F 225. I am likely to try almost anything once.
T F 226. I think that I lack "backbone" in some situations.
T F 227. I really feel uncomfortable at parties.
T F 228. I wish that I were more assertive.
T F 229. I am pretty messy by nature.
T F 230. The world is generally a good place.
T F 231. I am a very calm person.
T F 232. Being nervous is just part of me.
T F 233. I find some things just very depressing.
T F 234. I could live the rest of my life never having another drink.
T F 235. Too much compromise is for losers.
T F 236. I like it when someone else takes charge.
T F 237. I like to have others around when I work.
T F 238. Projects should always be well coordinated.
T F 239. I like to do things on the spur of the moment.
T F 240. I'll accept some risk as long as there's the chance I'll have fun.